Telephony.

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The Chicago Convention.

Those in charge of the arrangements for the convention of the National Independent Telephone Association, to be held at the Hotel La Salle, Chicago, February 18, 19 and 20, report that the signs are that next week's meeting will be one of the largest ever held by the organization. An unusually keen interest is felt throughout the field just at this time, and telephone men naturally wish to come to Chicago and learn at first hand of the important matters now engaging the attention of the industry, and what their colleagues have to say about these issues. Reference to other pages of this issue will show that the program prepared for the convention will be interesting and valuable to everybody connected with the telephone business. The daily sessions will be well worth faithful attendance.

This year the ladies are given a general invitation to attend the banquet, and many telephone men will bring their wives to this affair, which marks the close of the meeting. The committee has made a special effort to make the banquet this year a notable event in the way of music, menu, addresses and general entertainment. Come to Chicago if you can. The manufacturers' exhibits, the proceedings of the convention, the sessions of the technical conference will all be helpful to you in the year's work. It is *your* convention, and deserves *your* attention.

A Promise of Increased Long Distance Efficiency.

Judging by the reports, official and unofficial, received by TELEPHONY during the past few months of the tests of the Grissinger repeater, recently inaugurated and even now being carried on over the long distance lines between Chicago and St. Louis, the Independent telephone companies of the country have much to hope for in the matter of increased long distance efficiency.

Many attempts have been made to perfect a telephone repeater or relay for increasing efficiency of transmission on long distance telephone circuits. Various types of repeaters have been invented and but one, a two-way repeater, has up to the present time, been used commercially. Most of the repeaters are known as one-way repeaters, that is, they can be operated in but one direction only. A person desiring to receive through them must use a switch to cut out the repeater and switch it in when about to talk.

During the past few months, tests have been made in laboratories of another two-way repeater, invented by Elwood Grissinger, an electrical engineer and investigator, of Buffalo, which promises to fulfill the various conditions essential to the successful increase of the transmission efficiency of long distance lines by the relay or repeater method.

The various laboratory tests are said to have been exceedingly satisfactory, and tests are now being made daily on the Independent toll circuits between Chicago and St. Louis. The results of the tests so far made seem to indicate that the new repeater is adaptable for service on commercial long distance lines and that it greatly increases telephone transmission over long distances. An account of these tests is given elsewhere in this issue. It is safe to say that the whole Independent field will eagerly await further information as to the outcome.

Telephony Extends You a Cordial Welcome.

TELEPHONY'S offices and its rooms at the national convention have been, for many years, the headquarters of telephone men visiting Chicago for the great annual meet of the National Independent Telephone Association. It is sincerely desired that such shall be the case this year as well.

There are many ways in which we may be helpful to the members of the association, the visitors and the friends of both. Let us know what they are. Do not hesitate to have your mail addressed in care of this office. Come in whenever you care to and use our telephone, our stationery, our office conveniences; make the south end of the third floor of the Monadnock Block your business headquarters while you are in the city—and do it without hesitation.

TELEPHONY'S quarters at the La Salle Hotel are located right beside those of the National association, and you will always find there some member of TELEPHONY'S staff who will be ready and glad to serve you in any way possible.

The Man Who Knows It All

By HERBERT KAUFMAN

His conceit is his defeat—his constancy to himself is a model of devotion for all lovers. He neither wishes nor misses the regard of others—he's a combination Darby and Joan.

He seeks his model in a mirror—measures himself by his own image and never falls short of his ideal. He is intolerable of all the rest of the world—and to it.

He heeds what pleases him most and not what helps him—he makes no friends because he destroys the basis of friendship—that frankness which warns a man of his errors before they have time to grow into habits. He is insulted at the truth—he has not learned and will not be taught that sincerity is seldom flattering and that flattery is never sincere.

His universe is a swelled head with the pronoun "I" for an axis. His brain is stunted because he will not let it expand—he denies it nutrition—he is no longer in an absorptive mood—he considers himself beyond the point of learning and is therefore unfit to teach.

His ability lessens as his complacency grows—his sense of humor soons deserts him or he would realize that he is long eared instead of long headed. He is a boor and a bore, constantly inflicting his lopsided theories and advice upon his listeners. Those who voluntarily remain within his circle are objective—they have either found a use for him or hope that he will find a use for them.

He builds his life badly because he builds alone—in his hour of opportunity he neglects to earn well-wishers and in his hour of distress his smirking, fawning intimates (upon whom he has burdened his offensive mannerisms) are first to add their kicks to that of misfortune.

He carries his egotism into his business. If in earlier years he created a success, he insists that all who follow after him must of necessity either be followers or be fools. He does not know that he is wrong until he is wrecked—his conceit makes him color blind to all signals of danger. He sniffs at his competitors and permits them to expand without opposition until they can sniff at him.

He must fail because he does not keep his mental mechanism up to date—he must fail as inevitably as a hatter who persists in creating styles which pleases himself, without regard to the wishes of his customers. He is like the recruit who declared himself the only man in the entire regiment keeping proper step.

You can't help him, because he can't hear you—there is no deafness so complete as that of egotism—no blindness so absolute as that of those who will not open their eyes.

He is a danger and a menace to any enterprise—a stubborn mule hitched with his head toward the dashboard.

One wagon wheel turning in reverse action forces the other three to strain doubly hard—one such man in a business can uselessly double the work of all his associates. He is always sure that he is in the right, but he never takes into account how much his rights have a right to weigh for the "right of way."

The sooner he is eliminated the better for all concerned—he is a solitaire player and doesn't belong in a game with partners.

He is neither curable nor endurable. He's a cheap riddance at any price—even at his own idea of his value.

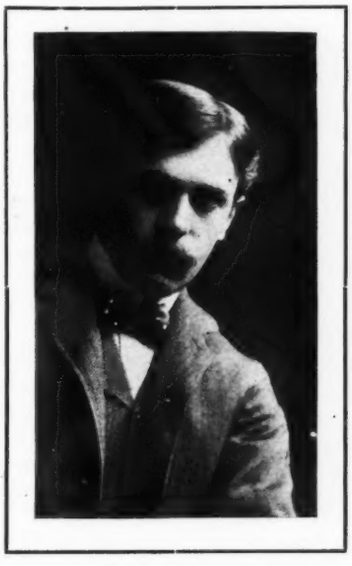
Copyright by Herbert Kaufman.

Grissinger Telephone Repeater Tried on Commercial Lines

Announcement of Successful Trials of New Device for Improving Telephone Transmission—Two-Way Repeater Used on Long Distance Lines Between Chicago and St. Louis Produces Improvement in Transmission Estimated Between 100 and 200 per Cent.

By John Grant

The month of January, 1913, witnessed the first trial of the Grissinger telephone conversation repeater on commercial telephone lines. Through the co-operation of the Illinois Telephone & Telegraph Co., of Chicago, the Tri-State Telephone Co., of St. Paul, Minn., and the Postal Telegraph Co., of Chicago, the repeater was inserted on the circuit between Chicago and St. Paul. Conversations were held with and without the device, and marked improvement in the transmission was noted by all observers. Later the repeater was tried on the circuit to St. Louis, Mo., and a similar, if not greater, improvement resulted.



Elwood Grissinger.

The word "repeater" is one which must be used with caution and due respect for the various meanings which have been linked with it. We have been familiar with the telegraph repeater, by means of which the range of telegraph operation has been greatly repeated. The automatic system has its own repeater, which has worked its way successfully into regular use in many places. Lastly there is the conversation repeater, of which the Grissinger repeater is a type.

The telegraph line, while not as susceptible to line conditions as the telephone, suffers considerably from the effects of resistance and capacity, which weaken and distort the electric impulses to such an extent that, on long lines, telegraphy becomes slow and tedious and even impossible. The telegraph repeater was introduced with the idea of utilizing a weak but distinct wave or impulse to control by relays the current from a second battery, thereby generating a new impulse which should travel on to the destination. Its success is now a part of telegraph history.

The automatic impulse repeater has its place in the automatic system of switching, involving several duties, as follows: The taking care of auxiliary circuits, so that a two-wire trunk line may be used between offices; the supply of battery current to the subscriber's telephone from battery in his own office; and the repeating of the switching impulses by means of which the automatic switches are operated. Conversation is not repeated, but passes in the same way that it would through a cord circuit.

It has been the dream of men for a long time to do for the long distance telephone line what the telegraph repeater has done for the long distance telegraph line. That is, to perfect a device for generating a new electrical wave which shall have the same characteristics as the old, weakened wave, and pass the new wave along the line with increased power to the destination. It is not a "booster" action in any sense of the word, for the old wave does not pass on into the second section of the line. It merely serves as the regulator, to give the proper character to a newly generated electrical wave, which travels in the second section of the line from the repeater to the destination.

For many years people have worked on this problem, with but indifferent success. Some of the repeaters produced, met part of the requirements, but failed in being unable to fulfill all essential conditions.

The fundamental requirements, which have been revealed by the years of experiments, are briefly as follows:

1. The repeater must be able to generate a new wave which is much stronger than the old wave, even when loaded with all the apparatus of an auxiliary nature which may be necessary to commercialize it.

2. The repeater must be able to generate a correct wave, one that will faithfully reproduce all the qualities of the original conversation. It has been found more easy to reproduce music than articulate speech, but the latter is that with which the telephone repeater must deal almost exclusively.

3. The repeater must be able to give two-way service without additional line wire or any accessory apparatus which the user must manipulate. The additional apparatus or circuits necessary to give the two-way service must not impair the quality of the reproduced wave, nor reduce its amplitude so much that the delivered wave shall not be several times the received wave.

4. The repeater must be so ruggedly built that it will stand abuse and neglect and the absence of expert attention for considerable periods of time. This means that it will not get out of adjustment by changes of temperature or by the operator ringing through the apparatus.

The repeater which was tried upon the Independent toll lines running out of Chicago, is the invention of Elwood Grissinger, consulting electrical and mechanical engineer of Buffalo, N. Y. For the past 14 years while practicing his profession, he has carried on countless experiments in his private laboratory, designing, building, testing, rejecting, starting again—the path which only the inventor can understand. During this time he says that he has drawn up more than a thousand repeater circuits and now firmly believes that a successful one is attained.

Mr. Grissinger has been very methodical in his work. It has been his practice to follow up with scientific tests every feature of the devices upon which he was working, so as to know that the results which he obtained were based upon fundamentals and not upon combinations of favorable circumstances.

During the past year, the repeater has been subjected to rigorous tests by engineers and apparently has stood the ordeal. The practical test of meeting line conditions as they occur in actual lines is now being made. During the various tests, it was so connected to a toll line between Chicago and St. Louis that it could be inserted or removed at will, by the mere operation of a key on the toll switchboard. This enabled a quick change to be made, and a comparison of the transmission noted. Various observers have estimated the improvement as between 100 and 200 per cent.

The Staff of the Inter-State, of Aurora.

TELEPHONY has for some time waited patiently for this photograph of the staff of the Inter-State Independent Telephone & Telegraph Co., of Aurora, Ill., because it believed the field at large, and particularly that portion of it which is affiliated with the Inter-State, would be glad to know something of the men who are now directing its affairs.

L. C. Griffitts, general manager of the company, and E. L. Barber, at present its special agent and lending his

**Louis A. Lund,
Traveling Auditor.**

aid to its rehabilitation, need no introduction to telephone men. Both have been connected with the Independent movement for many years, both have achieved conspicuous success in it, and both have considerable holdings in it apart from their interest in the Inter-State. Mr. Griffitts, as is well known, came from Louisville, Ky., where he was chief engineer for the Central Home, to assume the management of the Inter-State system.

H. B. Crandall, engineer for the Inter-State, began his technical work with the Western Union Telegraph Co., in 1898. He was called from Vincennes, Ind. (where he was manager of the Knox County Home), to take his present position, after the new management took hold at Aurora. He has had wide experience in his profession.

Charles R. Peel, general superintendent of the company since 1910, and latterly devoting his time to an appraisal of the properties, began his telephone career as a solicitor, at Springfield, in 1903, working up through various administrative positions to that of general superintendent.

W. M. Brown, auditor, is a Louisville man, having been connected since 1901 with the Independent local and long distance properties centering in that city. He is a specialist in telephone accounting and for some time fixed rates and handled toll clearings for the Independent companies through Kentucky.

G. J. Beverley, auditor, is an Aurora boy, who has been with the Inter-State since 1908. He began work for the corporation as assistant bookkeeper and was with it during a considerable time prior to the reorganization by the interests now controlling it.

Harry E. Jeffery is district manager at Aurora. His electrical experience dates back to the early days of electric street railway operations. He got into the telephone business in Michigan about 1908. Later he was sales engineer for the Swedish-American Telephone Co., covering both the states and Canada, and afterward going with the Valley Home, at Saginaw. He resigned the general management of that company to take up his work at Aurora.

James A. Seals is traffic engineer. He has had an extensive experience in various parts of the country, which has well fitted him for his present position. Toll line development and the handling of local, suburban and toll traffic for both Independent and Bell companies have been his work for over eight years. He went to Aurora from the Illinois Telephone & Telegraph Co., of Chicago, last August.

Louis A. Lund, travelling auditor for the company, who was not in Aurora when the group picture was taken, and whose portrait, therefore, is separately shown, has made accounting his life work, having followed that profession since he was seventeen years of age.

Administrative Staff of the Inter-State Independent Telephone & Telegraph Co., of Aurora, Ill.—Sitting, Left to Right: W. M. Brown, Auditor; L. C. Griffitts, General Manager; E. L. Barber, Special Agent; Jas. A. Seals, Traffic Engineer. Standing, Left to Right: H. B. Crandall, Chief Engineer; Chas. R. Peel, General Superintendent; H. E. Jeffery, District Manager; G. J. Beverly, Auditor.

A Quartet of Men Prominent in the Telephone Field

FRANCIS W. DUNBAR, patent expert and consulting engineer, specializing in telephone and electrical engineering, was educated in eastern Massachusetts, completing his schooling in the Massachusetts Institute of Technology, from which he graduated with the degree of B. of A. He is a member of the American Institute of Electrical Engineers. Mr. Dunbar was born in Chicago, October 8, 1868. Immediately after leaving college he associated himself with the American Telephone & Telegraph Co., as assistant engineer. This was in June, 1890. In June, 1893, he resigned from the service of the A. T. & T. Co. He participated in the organization of the Kellogg Switchboard & Supply Co. and acted as its chief engineer for a number of years thereafter. Mr. Dunbar has been well known in the Independent telephone field for many years. He has been closely connected with a number of important properties, both manufacturing and operating and has developed many valuable features of the business. He is now, and has been for some time, engaged in private practice.

JAMES B. HOGE, of Cleveland, Ohio, president of the Automatic Signal & Appliance Co., the Cleveland Machine & Mfg. Co. and the Electric Appraisal & Inspection Co., and manager of the Telephone Fire Insurance Exchange, was born in Belmont county, Ohio, December 20, 1866. He augmented his common school education with a night course at the Delaware Ohio Business College. Before entering the telephone field he served as agent and operator for the Baltimore & Ohio Railroad Co. In 1894 he organized the Black River Telephone Co., at Lorain, Ohio, with the operation of which he was actively connected. Until recently Mr. Hoge has been closely associated with the Independent telephone business in a number of ways. He still retains many of these interests and may properly be said to have never got very far away from the industry. Mr. Hoge has long been a prominent figure in the activities of the National Telephone Association. He is a Mason and a member of the Union and Euclid Clubs, of Cleveland.

RALPH ERVILLE MacDUFF, secretary and treasurer of the Paragon Sellers Co., Chicago, was born in Peekskill, N. Y., May 8, 1882. He was educated in the grade and high schools of Flint, Mich., and the Detroit College of Law. In 1899 he associated himself with the Lehigh Valley Coal Co., in Chicago, with which concern he remained five or six years, when he went on the road for Frank B. Cook, travelling all the territory east of the Mississippi River. While with Mr. Cook, he became one of the original stockholders of the Durant Electric Supplies Co., of Chicago, now succeeded by the Paragon Sellers Co., although he took no active part in its management. Later, for three years, he was secretary and treasurer of the Cooper-Hewett Co., of Louisville, Ky., handling telephone and electric light specialties. Severing his connection with this concern he again went with Frank B. Cook. On June 1, 1910, he helped reorganize the Durant company under its present name, the Paragon Sellers Co. He is a member of the Sons of Jove and Chicago Electric Club.

FRANK L. ELDRIDGE, assistant secretary and field manager for the Central States Telephone Service Association, with headquarters in Chicago, has been engaged in the telephone business practically since leaving school. For over a year he was with the Santa Fe Railroad in Indian Territory and Oklahoma, on construction work. On May 1, 1903, he became associated with the Chicago Telephone Co. as collector. He transferred to the A. T. & T. Co. four years later, taking up work as special agent and adjuster of disputed toll charges. In 1909 he was made service inspector, doing special work in connection with traffic, operating and commercial departments, handling various service observations and tests. He was in charge of the company's arrangements at the National Republican Convention, in 1908. In 1911 he went with the Illinois Tunnel Co., now the Illinois Telephone & Telegraph Co., in Chicago, as special agent on toll business. When the Service association was formed, in 1912, he assumed office in it. He was born in Wolcott, Ind., June 23, 1882.

What Well Directed Publicity Is Doing in Chicago

A Sketch of Some of the Methods Employed by the Illinois (Independent) Telephone & Telegraph Co. to Advertise its Service, and How They Are Working out—Newspaper Display Advertising, Booklets, Etc.—A Clever Music Hall Singing Act

By Rufus Hatch Holbrook

Progress which may properly be termed phenomenal is being made by the Illinois Telephone & Telegraph Co., formerly the Illinois Tunnel Co., which is operating the automatic telephone system in Chicago, in competition with the Chicago (Bell) Telephone Co. Private branch exchanges are being installed by the company at the rate of upwards of 60 a month, in addition to an ever-increasing number of regular service telephones, main and party line business and main and party line residence.

C. W. Winkler, commercial superintendent for the company, has organized a large and exceptionally effective staff of salesmen, who are turning in above 1,500 contracts a month. An indication of the thoroughness with which the subscription list of the company is being built up and the care which is being exercised to make it substantial and worth while, is found in the fact that every application is passed upon by the credit department of the company before a move is made to install service. If the credit of the individual or firm is found to be impaired, further investigation is made, and the contract is declined in case the situation is financially doubtful.

Obviously, therefore, the company's list of subscribers is being made up of the solid element of the citizens—people who pay their bills and whose business is worth seeking. Obviously, too, the list is a real one—without a "cull" in it. When the present administration of the Illinois Telephone & Telegraph Co. took hold, with J. W. Callahan as general manager, this was one of the first things to receive attention. From that day to this the process has continued, until now the former list is practically cleaned up and the financial derelicts are weeded out. The result is shown in the fact that collections for January were the largest in the company's history.

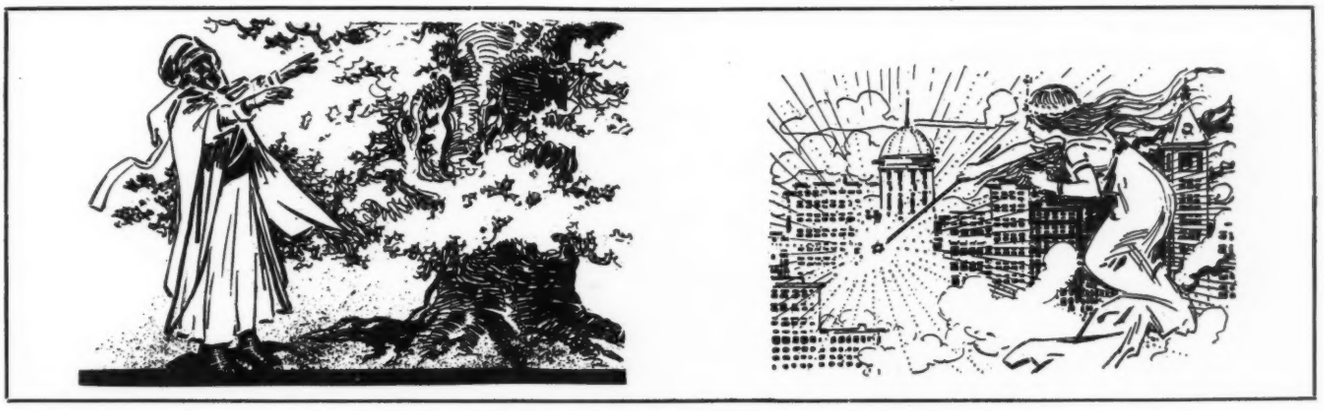
MONTGOMERY WARD & CO
Montgomery Ward & Co.
Install Automatic Telephones
—thus providing a 4 or 5-second connection between every department of this, the greatest and largest building of its kind in the world.
The installation of Automatic Telephone Service, besides giving each official of this immense mail-order establishment a more intimate control of his department, also provides the employees and customers with
Unlimited Service
10-Second Connections
Secret Conversation
No False Busy Signals
No Disconnection—
until the conversation is ended.
We are daily adding scores of new names to our already large list of business houses. Your name ought to be there. Don't put it off any longer, but learn how you can secure the better service, quicker service, cheaper service, secret service which the Automatic Telephone provides without its costing you a single penny more than you are paying now.
AUTOMATIC
TELEPHONE
Illinois Telephone and Telegraph Co.
162 West Monroe Street, Chicago
Send a postal today and learn the facts from one of our representatives, or phone C. W. WINKLER, Commercial Supt., Auto. 33-124. Bell: Franklin 130.
IT

An Exceedingly Effective Advertisement in the Chicago Daily Papers.

Especially notable in the operation of the commercial department has been the campaign of publicity which has been steadily carried on. This has taken varied forms. TELEPHONY printed some time ago reproductions of cards which the company supplies for the use of its larger business subscribers. These cards are designed to be enclosed in the mail which the subscribers send out each day. They call attention to the fact that that company uses the automatic extensively and ask those having business relations with it to use the Independent lines.

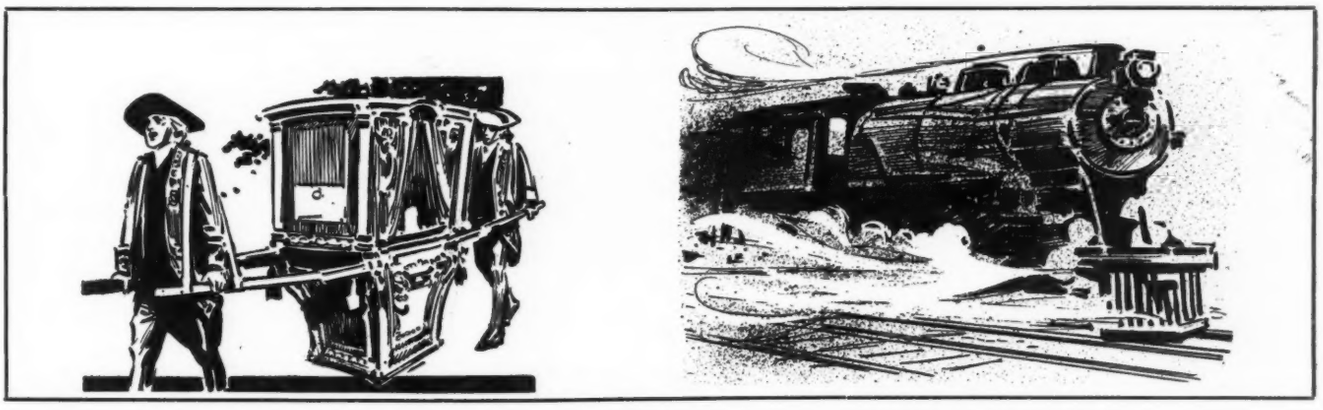
Newspaper space, effectively handled, has played no small part in familiarizing the public with the merits of the Independent service, as also with its rapid extension throughout the city. These advertisements have been written along varying lines, one of the most effective being the playing up of some of the larger firms which have adopted and installed the Independent service. The one which was inserted in the Chicago dailies following the close of a large contract with Montgomery Ward & Co., the big mail order house, is a typical example. It is here reproduced full size.

Another plan for general publicity, through the medium of the mails, is a booklet, bearing the caption, "A Modern Miracle." This is of a size to slip easily into an ordinary envelope, without folding. Its 20 pages are given up largely



Contrasting Illustrations in Booklet—Ancient and Modern Miracles.

to a running story of the development of the automatic equipment, and its advantages over the manual Bell apparatus employed by the company's competitor. The booklet is exceedingly well written and attractively printed. The rates for the various classes of service are given, with full



Other Booklet Illustrations—From the Sedan Chair to the Modern Rapid Transit Train.

information, enabling a prospective subscriber to acquaint himself with what the company has to offer. Here is an excerpt showing how well the "modern miracle" idea has been worked out:

"Many miracles are only ordinary occurrences—with the time element dropped out. To see an acorn converted into a towering oak—all in an instant—would amaze us. Not because something small has become large, for each day seeds are slowly growing into huge trees. That's Nature's way of doing things—the ordinary way. But when an epoch is bridged in a flash—through the agency of some marvelous invention—that's a miracle.

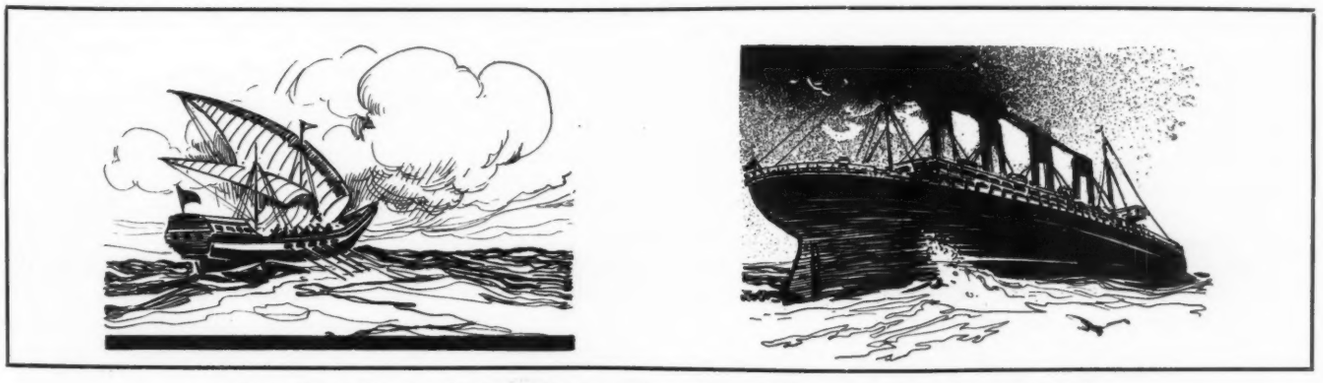
But miracles are rare. Change and growth require time—centuries.

Between the litter carried by menials and the modern locomotive with its train of luxurious coaches, there lies a bridge of generations, covering slow, laborious development.

Ideas, inventions, new ways of doing things—all these come slowly. Old methods, old habits, cling.

In the story of human advancement the whole tread is away from doing things by hand.

Steam steps in where rowers sat in ancient galleys. Automatic looms abolish the housewife weaver. Furniture is manufactured and food prepared by machines. Books are printed, paper made—and a thousand and one other things are done automatically—by machines."



From the Galley to the Ocean Greyhound of Today—Other Illustrations From Booklet.

The booklet then goes on to show what the Illinois company has done in Chicago, as follows:

"In a single year, from next to nothing to a system which

more than equals Chicago's entire telephone service in 1900—that is the record of the automatic telephone in Chicago.

Well may it be called 'A Modern Miracle'!

This huge development has forgotten to go slowly—forgotten to follow the laws that govern such things.

Thousands of people have suddenly changed the habits of years—they have switched from one method of telephoning to another.

And why? Simply because the new method is so much better than the old. It compels the change."

The illustrations employed in the booklet are striking. Those in the fore part bear out forcefully the contrasts shown in the matter quoted. Six of these are reproduced with this article. Others are scattered plentifully all through the booklet and emphasize the points made in the text.

One particularly clever publicity "stunt," which has attracted much favorable comment, was recently put on at the American Music Hall, in Chicago, where Nora Bayes and Jack Norworth, the two popular comedy singers are playing to packed houses every night. A number of loud speaking enunciators have been installed in various places about the auditorium, some in the ceiling, some under the balconies, others on the main floor. The pair sing in the spot light for a time, the rest of the stage being dark. When one verse of the "Pinkerton detective moon" song has been sung, Norworth "pulls" a little "business" leading up to the announcement that he is going to sing the next verse into the *automatic telephone*, which, he is told, gives the only secret service possible, etc. He steps out of the range of the spot light for a moment and then, while not a sound of his voice is heard from the stage, it comes successively from different parts of the house, the various enunciators being connected, one after another, from the rear of the stage by means of a Corwin key. Miss Bayes, while this is going on, interjects bits of comedy dialogue.

The novelty of the act brings instant recognition from the audience, which later starts homeward with a rather vivid conviction that the automatic telephone—the Independent—is the one telephone to use.

The foregoing are but a few of the many ways in which the Illinois Telephone & Telegraph Co. is daily increasing its popularity and extending its list of subscribers in Chicago. And the success of these endeavors is amply borne out by the company's present situation and its steady expansion.

Program for National Independent Telephone Meeting

Complete and Official Arrangement of Events for Three Day Convention in Chicago Next Week—Unusual and Valuable Features in Every Session—What the Service Association Proposes to Do in Technical Conference—Full List of Exhibits

On the opposite page is printed the complete official program for the annual convention of the National Independent Telephone Association, to be held at the La Salle Hotel, Chicago, on February 18, 19 and 20.

Probably no program for a national meeting has ever been prepared with more care, or has contained more of value to the members of the association and the entire Independent telephone industry. No telephone man who makes Chicago his temporary home next week can afford to miss a single speaker, or a single discussion. And no Independent operator can afford to remain away from Chicago and this series of meetings. Make every possible effort to come to the Windy City and then attend every meeting.

The exhibitors will close their rooms while the sessions are in progress, so that exceedingly lively and interesting feature of the convention will offer no temptation to remain outside the main auditorium. Besides which, ample time has been allowed visitors to canvass every exhibit—and they will be well worth looking over. Never has there been such an array of new inventions, the latest developments of standard apparatus and equipment under one roof. This alone will be worth the cost of the trip.

The list of exhibitors revised to the date of TELEPHONY's going to press this week is given below. These rooms are all on the seventeeth floor of the La Salle, which has been given over entire for this purpose.

EXHIBITORS AT CONVENTION.

1761—Alexander Hamilton Institute, New York City.

1758—Alyea Manufacturing Co., Chicago. Indiana anchor.

1723—American Electric Co., Chicago. Telephone apparatus, accessories and devices.

1737—American Surety Co. of New York, New York City Surety bonds.

1711—American Telephone Fire Alarm Co., Chicago. Telephone fire alarms.

1730—Andrae, Julius, & Sons Co., Milwaukee, Wis. Telephones, switchboards, construction material.

1708, 1709, 1710—Automatic Electric Co., Chicago. Automatic telephones and systems.

1712—Illinois Telephone & Telegraph Co., Chicago.

1725—Butler Electric Co., Perry, Iowa. Electrical apparatus.

1700, 1701, 1739—Cracraft, Leich Electric Co., Genoa, Ill. Telephones, switchboards and apparatus.

1727—Coffey System & Audit Co., Indianapolis, Ind. Telephone accounting systems.

1705—Cook, Frank B., Chicago. Telephone protective apparatus and supplies.

1704—Corwin Telephone Manufacturing Co., Chicago. Interior telephones.

1732—Cutter, Scott Co., Oswego, Ill. Telephone specialties.

1706, 1707—Dean Electric Co., Elyria, Ohio. Dean telephone products, telephones, switchboards and telephone parts.

1731—Duplex Metals Co., Chicago. Copper-clad wire.

1733—Electric Appliance Co., Chicago. Switchboards, telephones and supplies.

1727—Electric Specialty Mfg. Co., Cedar Rapids, Iowa. Wireless cable tester.

1747—Electric Storage Battery Co., Chicago. Storage Batteries.

1744, 1745—Ericsson Mfg. Co., Buffalo, N. Y. Switchboards and telephones.

1751—Gottschalk Waterproof Sanitary Transmitter Co., New York City.

1742, 1743—Holtzer-Cabot Electric Co., Chicago and Brookline, Mass. Telephone parts and supplies.

1748—Illinois Electric Co., Chicago. Electrical supplies.

1750—Indiana Steel & Wire Co., Muncie, Ind. Wire and strand.

1716, 1717, 1718, 1719—Kellogg Switchboard & Supply Co., Chicago. Switchboards, telephones and parts.

1738—Leeds & Northrup Co., Philadelphia. Cable testing apparatus and electrical measuring instruments.

1897 **PROGRAM** 1913

Sixteenth Annual Convention

National Independent Telephone Association

Hotel La Salle, Chicago

February 18, 19, 20, 1913

MONDAY, FEBRUARY 17.

2:00 p. m.—Meeting of Board of Directors—Offices National Independent Telephone Association, 1404-1405 McCormick Bldg.

TUESDAY, FEBRUARY 18.

CONVENTION.

19th Floor, Convention Hall.

10:00 a. m.—Address of Welcome, Hon. Carter H. Harrison, Mayor of Chicago.
Response—N. G. Hunter, Wabash, Indiana.
President's Address—Manford Savage, Champaign, Illinois.
Announcements.

Tuesday Afternoon.

Visit Exhibits, 17th Floor.

WEDNESDAY, FEBRUARY 19.

9:00 a. m.—Convention, 19th Floor.
Election of following committees:
Nominating Committee. Credentials Committee. Committee on Resolutions.
10:00 a. m.—Program conducted by Central States Telephone Service Association.
12:00 Noon—Report of Nominating and Credentials Committees.

Wednesday Afternoon.

2:00 p. m.—Program conducted by the Central States Tephone Service Association
5:00 p. m.—Polls open for election of Directors and close at 10 p. m.

Wednesday Evening.

7:30 p. m.—Banquet.

THURSDAY, FEBRUARY 20.

10:00 a. m.—Convention, 19th Floor.

Address by Samuel G. McMeen.
Address by J. W. Callahan.
Address by C. E. Tarte.
Reports of Committees.
Report on Election of Directors.
New and Unfinished Business.

PROGRAM CONDUCTED BY THE SERVICE ASSOCIATION.

Wednesday Morning Session.

Meeting called to order at 10 a. m.
Address by J. W. Callahan, President of the Telephone Service Ass'n.
Subject: "The Telephone Service Association and Its Purposes."
Field Observations by one who knows.
Illustrated Lecture on the Manufacture and Care of Dry Batteries.
Illustrated Lecture on the Manufacture and Use of Wire.
Discussion on the above papers, and general discussion of items of interest brought out by all of the foregoing lectures.

Wednesday Afternoon Session.

Meeting called to order at 2 p. m.
Lecture on Advertising.
Lecture on the Commercial Problems in Moderate Size Exchange.
Illustrated Lecture on Telephone Transmission, with discussions relative to the construction and maintenance of toll lines and the central office equipment used in connection with local and long distance transmission.
Illustrated Lectures on the Manufacture, Care and Maintenance of Storage Batteries.
Lecture on Telephone Traffic, together with a discussion and supplementary short lectures by Traffic Engineers.

The lectures and talks will be general in character and there will be nothing of a nature calculated to advocate apparatus or material of any individual manufacturer. The lectures will be as non-technical as is practical, and will be given with the object in view of interesting and instructing the managers, owners and officials of telephone plants.

All Exhibitions will be closed during the hours of the Conference, and every Exhibitor is requested to be present in the Convention Hall at the Meetings.

CONVENTION COMMITTEE ROOMS

1807—Committee Room. **1808—Committee Room.**
1809—Association Headquarters. **1810—Committee Room.**
1711—Committee Room.

Opposite Entrance Convention Hall, 19th Floor

Registration—Central States Telephone Service Ass'n.—Telephony

1760—Manhattan Electrical Supply Co., Chicago. Batteries, telephone supplies and apparatus.

1734—Matthews, W. N., & Bro., St. Louis. Patented line specialties.

1713—Monarch Telephone Mfg. Co., Ft. Dodge, Iowa. Switchboards, telephones and supplies.

1736—National Carbon Co., Cleveland, Ohio. Dry batteries and carbon.

1720—Nungesser Carbon & Battery Co., Cleveland, Ohio. Batteries.

1735—Oshkosh Mfg. Co., Oshkosh, Wis. Construction tools, linemen's supplies.

1740, 1741—Reliable Electric Co., Chicago. Telephone and switchboard protectors, electric specialties.

1749—Roebling's, John A., Sons Co., Trenton, N. J. Telephone wire and cable.

1726—Specialty Device Co., Cincinnati, Ohio. Bierce Cable sleeves.

1746—Standard Underground Cable Co., Chicago. Copper wire and cable.

1721—Stewart Bro., Ottawa, Ill. Test devices, trouble finders.

1714, 1715—Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y. Telephone apparatus, aerial and underground cable.

1752, 1753—Swedish-American Telephone Mfg. Co., Chicago. Switchboards, telephones and supplies.

1702, 1703—The Telephone Improvement Co., Chicago. Automanual, and manual switchboards, telephones and telechronometers.

———TELEPHONY—Opposite entrance Convention Hall, 19th floor.

1759—Thompson-Levering Co., Philadelphia. Electrical measuring instruments.

1722—Utilities Indemnity Exchange, St. Louis. Inter-insurance on public utilities plants.

1724—Vote-Berger Co., La Crosse, Wis. Drive and twist anchor.

The Central States Service Association will have the entire day, Wednesday, with the exception of a few brief formal transactions, for its technical and practical conference. Every minute of the time alloted to this organization will be crammed full of novel, valuable and entertaining doings.

The outline in the program of the ground which the committee in charge of this work will cover affords only the faintest glimpse of what is to be done. No practical and technical conference in the history of the association has been handled so comprehensively as this will be. The best engineering, traffic and commercial brains of the industry will be devoted to producing for the Independent managers in attendance results which will be far reaching and invaluable. It is not amiss to add that the committee has also provided entertainment features of no mean order, the novelty of which will appeal to everyone. Some of these "stunts" will be entirely unexpected and unannounced. Therefore, do not overlook a single bet on Wednesday, either morning or afternoon.

The banquet on Wednesday, at 7:30 p. m., will be an occasion which should not be passed by. TELEPHONY has mentioned some of the features of this function in previous issues. There are others which the entertainment committee does not care to bulletin in advance, thus adding the pleasure of a keen anticipation of something especially entertaining. The "big eats" will be particularly worth while. The speaker's table will seat men thoroughly at home on their feet as after dinner speakers, besides talent carefully gathered outside the telephone industry.

The committee wishes to announce that the presence of the ladies is particularly desired at the banquet. Visitors accompanied by their wives, daughters or sweethearts will, it is stated, be even more welcome than the lonesome males—and the welcome to said lonesome males is to be a warm one.

The Telephone in the Medical World.

The telephone has been a great factor in improving the health and welfare of the community, according to the view of the editor of The Medical Review of Reviews. He says in part:

"With the development of modern transportation, it was said that the oceans no longer separated America from Europe and Asia, but served to connect them. In a similar way it may be said that telephones have helped to bring physicians and patients together.

The telephone has been a mighty factor in improving the health and welfare of the community. Health bureaus have been able to accomplish their work more rapidly and effectively by use of the telephone. Ambulance service has been developed to a high state of efficiency through the accessibility of telephones in all parts of the community. Rapidity of service, with promptness in telephoning, have served to save many lives that otherwise might have been lost.

The private practitioner, it is true, has suffered a marked decrease in his emergency calls through the recognition of the value of the ambulance service and the ease with which one may be summoned by telephones. In fact, the doctor's telephone is frequently used to call the ambulance. Only a few years ago the nearest physician was called for minor conditions at all hours of the night. Today the telephone saves many a long and needless journey. Frequently, because of the knowledge and appreciation that a physician may be quickly summoned by telephone in case of real necessity, the doctor is not called at all, as some transitory condition has disappeared before morning.

In contrast to this small loss is the gain through telephone visits in lieu of office calls. Such visits may be regarded as office visits, on the ground that, if telephones did not exist, it would be necessary for the patient to seek advice at the office.

Professor Bell and others who followed him in developing the telephone, added greatly to the comfort, happiness, progress and welfare of society, in all of which the physician has enjoyed his share."

This is a grateful recognition of another way in which the telephone has quietly, but steadily, ameliorated conditions, almost without our realizing what it was accomplishing.

Keeps the Toll Board in Front.

The photograph, which is here reproduced, was sent us through the courtesy of L. H. Roberts, manager of the

View of Exchange at Maysville, Mo.

De Kalb County Telephone Co., of Maysville, Mo. He points out the desirable arrangement whereby the toll board, with the chief operator, is in the front office and entirely separate from the local board. Mr. Roberts states that the company has all new Kellogg equipment.

Central Union Minority Interests Enjoin A. T. & T.

Bring Suit to Prevent Action at Special Meeting, Where Arrangements Were to Be Made to Sell Illinois Property to Chicago Bell—Make Serious Charges Against Majority Interests, Including A. T. & T. and Chicago Telephone Co. Officials

Last Saturday minority stockholders of the Central Union (Bell) Telephone Co., operating in Illinois, Indiana, and Ohio, obtained a temporary injunction restraining the American (Bell) Telephone & Telegraph Co. and the Chicago (Bell) Telephone Co. as majority interests, from voting a division of the property.

The injunction was granted by Judge Dever in the superior court, following the recommendation of Charles J. Trainor, master in chancery. It was served upon the officials of the companies involved at a special meeting called in Chicago, on Tuesday.

In a long bill startling charges were made against the American Telephone & Telegraph Co. the parent concern.

The principal assertion is that for years the company has been mulcting the subsidiary stockholders; has barred them from dividends they should have received; and is now attempting to squeeze them out altogether.

The petitioners are William A. Read, New York banker, and his associates, Charles J. Spencer and Charles G. Foster. Together they own 829 shares of Central Union stock, of a par value of $82,900. This is one-half the amount they once held, but the original blocks were cut in two in a process of stock reduction.

Each of the assertions of mismanagement is denied by B. E. Sunny of the Central Union and of the Chicago Telephone, vice-president of the A. T. & T. Co., and a leading figure in the proposed change. Mr. Sunny says the company will win the suit when it is brought for trial.

The proposed reorganization of the Central Union was part of a general rearrangement of Bell properties, whereby those in each state would be consolidated, and physically separated from those in other states. It is charged this was a ruse to remove the company from the operation of the federal interstate commerce act, inspired by fear of prosecution under the anti-trust act.

"It would make no difference in fact," said one of the attorneys for Mr. Read. "It is either an attempt to deceive the federal government, or—through assertions made in company letters—to deceive the stockholders."

Following are some of the charges:

The laws of Illinois, forbidding holding of Illinois stock by another corporation, Illinois or foreign, have been violated.

The federal anti-trust act has been violated.

The Central Union stockholders have been defrauded.

The American Telephone receipts have been fattened by unjust demands on the subsidiary.

The Bell company has forced the subsidiary to pay extravagantly for patent royalties—in some cases for appliances whose patents expired years ago.

Practically all revenue from fruitful long distance business has been absorbed by the parent company.

The Central Union directors have been forced into liability by the issue of $22,000,000 bonds in excess of the capital stock, and then relieved of liability by assurance from the parent company.

B. E. Sunny, Theodore N. Vail, U. N. Bethell, and a number of office employes are "dummies" on the Central Union board of directors.

The company has exchanged its old 5 per cent. bonds for new 6 per cent. bonds, paying a 5 per cent. retiring premium, a block of which went direct to the A. T. & T. treasury, and increasing interest charges by 1 per cent. unnecessarily.

Expense of the Bell fight on Independent companies forced on this one subsidiary. New plan will simply increase Bell monopoly.

Accounting under supervision of court necessary to save stockholders.

It is set forth in the bill that the minority stockholders have been urged persistently to keep their holdings, and promises of better business have been held out to them. Now they expect the A. T. & T. Co. and the Chicago Telephone Co., as holders of $32,700,000 bonds, to declare the property value eaten up by this prior claim, reducing the equity of the small minority stockholders to nothing.

The Central Union operates something over 700,000 miles of wire throughout Illinois, Indiana, and Ohio, excepting the small but exceedingly valuable territories of the Chicago, Cincinnati, and Cleveland fields. Its present outstanding stock is $5,450,000 par value of which the American Telephone owns $5,204,977. The company authorized in 1896 a $3,000,000 first mortgage bond issue and in 1899, a $6,000,000 consolidated bond issue, of which a total of $6,000,000 was issued.

Last July, although the first mortgage did not expire until 1916 and the consolidated until 1919, the bonds were redeemed at 105, requiring a $300,000 premium, part of which went to the American company as holder of a $1,000,000 block. The money for retiring this amount was borrowed from the parent company and, in return, it was given a block of notes, bearing 6, instead of 5, per cent.

To the parent company is now owing over $22,000,000 in demand notes and to the Chicago Telephone Co. $10,300,000. This is the indebtedness the Central Union stockholders have now been told would wipe out their equity. At the same time an offer of ⅜ in Bell stock has been made for their holdings.

On this the bill says: "The representations made by officers of said Union company that said company is insolvent are untrue, and are made for the purpose of compelling your orators to dispose of their shares of stock in said company upon the terms offered by said (Bell) officers. The tangible assets of said Union company are shown by the report submitted by it, covering the business for the year 1912, to be worth more than the sum of $37,000,000; that the licenses, franchises, rights, easements, good will, and other intangible assets of said Union company are worth as your orators believe the sum of many millions of dollars."

It is asserted the Central Union has been forced to buy its equipment at exorbitant prices from the Western Electric Co. the manufacturing branch of the Bell organization, by "unjust and inequitable" contracts. It is charged the company has had to pay extravagant rental for other instruments, amounting to 4½ per cent. of its gross revenue last year, and on these instruments patents are said to have expired years ago.

William J. Hagenah figured a fair valuation of $3.01 per set when he made his report to the Chicago city council. This was cut to $2.38 by Edward W. Bemis, but even on the higher valuation the total would be only $771,000. Yet in 1912 alone the Central was forced to pay a rental of $306,840, or a matter of 39 per cent. a year on the investment.

For extra-territory messages the Central company is not allowed to keep more than 12½ per cent. of the total reve-

nue. And this is further limited not to exceed 10 cents, plus a small mileage charge. For many years the maximum was 5 cents a message, no matter what the customer paid.

The plan to sell the Illinois assets, the bill continues, is a part of "a fraudulent scheme and conspiracy of all the defendants, conspiring and confederating together and being dominated by the controlling influence of the American company," to evade the federal commerce act and antitrust act, and is "a mere pretense and device and an attempt to deceive and mislead the officials of the federal government." The bill continues:

"The ultra vires acts above set forth already committed have subjected the charter of said Union company to the danger of forfeiture under the laws of the state of Illinois. The proposed sale for the unlawful purposes above set forth would be in violation of the charter rights and obligations granted to and imposed upon said Union company by the state of Illinois, and would amount to a complete abandonment of its charter and would form sufficient ground for the forfeiture thereof, to the irreparable injury of your orators.

Unless said proposed special stockholders' meeting called for February 11 is enjoined by this honorable court said defendant Sunny, vice-president of said American company, or some one else on its behalf, will vote the stock owned by said American company in favor of the proposed sale of all the Illinois assets of said Union company, of which company Sunny is president, to said Chicago company, of which said Sunny is also president; that said Sunny will purport to represent in said transaction both the vendor corporation and the vendee corporation, as well as said American company."

"The charges are unfair," said Mr. Sunny, in an interview given out after the injunction was granted. "The reorganization was not contemplated with the idea of evading liability under the Sherman act. In the first place, it would not so operate. It is a matter of plain business economy to get the state properties consolidated so as to facilitate reports to the various state commissions.

"The charges relative to the re-financing are absurd. The old mortgages covered the general properties, and would have to be canceled before these properties could be divided. Hence the notes, not secured by general mortgage. The higher interest rate was unavoidable, owing to market conditions, which every one knows, and also owing to the condition of the Central company. I do not regard the case as serious."

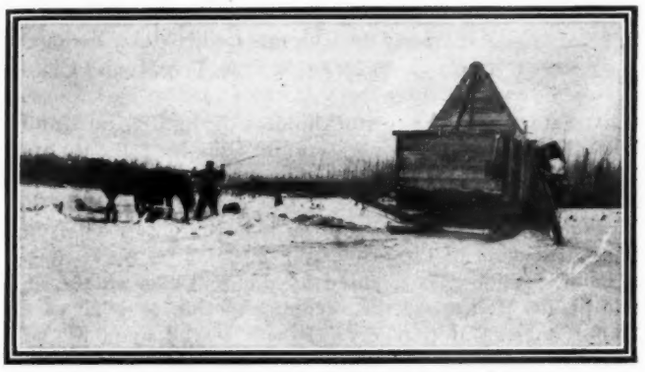
Mr. Sunny stated that an answer is being prepared and that the case will be fought out in the courts.

Interesting Scenes in the North Woods.

Through the courtesy of the Page & Hill Co., dealers in cedar posts and poles, with offices in Minneapolis, TELEPHONY

A Small Carload of Poles at a Page & Hill Camp.

is enabled to show here two interesting scenes in the cedar woods of Minnesota. These photographs were taken at the company's Camp 1, about 12 miles south of Red Lake. One shows a load of poles which, in itself, will make a moderate sized carload. The sled has bunks 16 ft. long, making the load 16 ft. wide. The other view is of the tank used for icing



Filling the Tank for Icing Roads in the Woods.

the roads to make the sledding easy. The tank is being filled by means of a barrel and a cross line. Both pictures were taken this season.

Wisconsin Convention Big Success.

All records were broken in attendance at the annual convention of the Wisconsin Telephone Association, held on Wednesday and Thursday of this week, at Madison. Thirty-five companies are now paid-in-full members.

At this meeting practical endorsement was given a tentative set of rules prepared by the Wisconsin Railroad Commission, establishing definite standards of telephone service. A resolution was adopted instructing the executive committee to confer with the Railroad Commission before the rules are printed and distributed. The rules were presented by J. N. Cadby, of the engineering staff of the commission. They will be printed in a later issue of TELEPHONY, together with Mr. Cadby's paper on the subject.

A legislative committee was appointed, consisting of W. F. Goodrich, La Crosse; W. L. Smith, Neillsville; Conrad Engsberg, Lake Mills; Nelson H. Snow, Mineral Point; and S. M. Pedrick, Ripon.

A number of talks were given and papers read which we are unable to record in this issue. The program was followed closely and the meeting was voted a big success and of great practical benefit to every one present.

The entertainment features included a performance at the Orpheum, where a special block of seats had been reserved. The same evening the banquet was given in the New Park Hotel, when the occasion was enlivened by good speakers and excellent food.

The following officers were elected: President, J. A. Pratt, Menomonie Falls; vice-president, W. L. Smith, Neillsville; secretary, P. J. Weirich, Monroe; treasurer, W. F. Goodrich, La Crosse. The officers and F. H. Runkel, Portage; F. M. Cole, Ashland; and E. R. Bowler, Sheboygan, constitute the board of directors.

TELEPHONY's representative covered the two days' sessions thoroughly and his report in full will appear in these pages next week.

Iowa Convention to be Held in March.

The annual convention of the Iowa Independent Telephone Association will be held at Des Moines, at the Auditorium, on March 11, 12 and 13.

North Dakota Association Will Meet in March.

The North Dakota Independent Telephone Association will hold its annual meeting at Valley City, N. D., on March 11 and 12. The program is now being prepared and will shortly be announced.

The Handwriting on the Wall

Have We Seen It?—Conditions Rapidly Changing—Convention Thoughts

By J. C. Kelsey

The banquet was on! One thousand revellers drank as if they were going into dry territory. Belshazzar got reckless and called for the sacred vessels that his father had stolen from Jerusalem. He thought the wine might taste better in them. And he got to seeing things.

"In the same hour came forth the fingers of a man's hand and wrote over against the candlestick upon the plaster of the wall of the King's palace, and the King saw part of the hand that wrote."

And you may be sure that the king was frightened! So would you be if the fingers of a man's hand should write over against the electric lamps upon the plaster of the walls of the La Salle banquet room, in some strange language! Like Belshazzar, you, too, would frantically call for some one to tell you what it meant!

And it came to pass that Daniel broke the news to him—that, in the new order of things, he had been weighed in the balance and found wanting!

Next week our banquet is on! Of course, we will not get gay with the sacred plates from Jerusalem. There will be no wine, nor will there be a king. In a sense, we will meet as exponents of competition and beneficiaries of a private ownership system.

Can any of you imagine that you will see the fingers of a man's handwriting over against the candlesticks—writing of the doom of private ownership and competition—that it has been weighed in the balance and found wanting?

I don't know why the story of the experience of ancient Belshazzar came to me as I read Governor Dunne's inaugural address, particularly that part relating to public utilities.

Remember, that Governor Dunne is not a corporation-fed gentleman. He is supposed to be as close to the "peepul" as any executive in America. Yet his address startled me, and I wondered if his words were written by the fingers of a man, over against the candlestick!

Here is what he says, and the boldest and the most ardent of you who believe in competition and private ownership, must give heed!

"The day of competition in the supply of gas, electric light and power, street railways and some other public utilities has passed. Monopoly in these matters has come to stay."

Now just pause a moment and think!

"Monopoly in these matters has come to stay." How does that strike you? Do you believe it? Some of you will be pleased and many of you will be displeased.

But go on. Governor Dunne says further: *"Only one utility-producing concern should be allowed that privilege for each utility in each city."*

Governor Dunne did not specifically mention the telephone. Yet that is the very utility which lies at the root of the present conditions. It started the whole thing.

Of course, just as one swallow does not make a summer, so do Governor Dunne's statements fall far short of settling the matter. He has predicted many things—especially as mayor of Chicago—that never came to pass.

But if laws are made according to his suggestion, then it does settle it, at least as far as one state is concerned. Accordingly, a condition and not a theory confronts us.

If the governor of a great state, such as Illinois, advocates these ideas, is it not time to consider this matter? How will it affect us? That is the question.

If the spirit of the times indicates monopoly, we must, of course, give heed. Does it? If it does, we cannot ignore it. It must be squarely faced.

A prominent New York financier says that he believes in competition as long as both competitors are making money.

He says further, that he does not believe money could be made by both competing companies. He said he knew of no such instances anyway.

Therefore, if he is correct, the solution is a merger, or an arrangement whereby each company maintains its individuality and only surrenders its losing localities. Is he correct? Is this the solution?

Governor Dunne is really thinking about a commission, empowered to grant mergers under state regulation. We already have it in nearly every other state in the Union, so this feature is not alarming.

In lighting and other utility work, the conditions of merger are not so onerous. It is easy to abandon an uneconomical pumping station, but in telephone service it is not so easy to abandon a terminal, or lose control of it.

The question of long distance service makes the telephone a special problem. I suppose that is why the telephone is never specifically mentioned, because no man can see the way out. There are too many complexities.

So much for monopoly handwriting by the hand of the governor. He inserts another clause—the most important one: *"One concern must be either the municipal corporation itself, or a private corporation."*

This may be the real handwriting on the wall. Anyway, it is a threat of what will happen to private ownerships if they do not do their full duty.

Such a law paves the way for municipal activity without the delay which is met at present.

We have had some very visible signs. You know it is said that coming events cast their shadows before.

John Wanamaker, long ago, said that the Post Office was the logical operator of the telegraph. Mr. Hitchcock, his more or less removed successor as postmaster general, has gone further.

The Nebraska legislature will wrestle, or is wrestling, with a bill giving county commissioners the power to build telephone lines between county seats and other localities. Telephone lines will be treated as roads and bridges. This surely is a compliment to the necessity of the telephone.

Just how this will work out, no one can say. Unless the privately-owned companies are allowed to use these lines, or are allowed fair terminal charges, they will have to give up or sell out to the municipalities.

Surely we are drifting swiftly, and must give heed to our directions!

And there is another handwriting on the wall, in Indiana and Illinois. That is the farm mutual movement, which really threatens, although it seems mostly in Central Union territory.

Logically, the farmers should own their own lines and take care of them. But they love free service too well. So this is a straw which blows toward the goal of municipal or county telephone service, where losses may be made up by indirect taxation.

How we all hate direct taxation!

You, yourself, are thinking. And you know everyone else is thinking thoughts which, 10 years ago, were construed as heretical or treacherous.

The telephone business is not in the storm center at all. It is only on the side lines.

The public has a general mistrust of everything. Never before were the motives of men and things so closely analyzed, and so much proof demanded. Even courts should see the fingers of a man's handwriting over against the candlesticks.

There is a demand for rough-and-ready justice. We don't like to see a man given 30 years for robbing a millionaire, and another man given one year for robbing millions from poor people.

Nor do we like to see a rich man released because he is sick, and a poor, friendless convict in the next cell languishing in sickness unto death.

We are tired of huge wealth parading itself, while children toil and families huddle in basements.

And it is in contemplation of these great wrongs and inequalities of justice that people attack the objects nearest to them.

In Illinois, Kansas, Nebraska and such states where no child toils, and where basements are unknown except for furnaces, coal and potatoes, the telephone is more likely to come into conflict. It is in these localities that there is the greatest likelihood of disturbance to our business.

But who is better able to handle a local disturbance than a locally-owned company? With directors and stockholders in every walk of life, each one paying his share of taxes in that locality—who is better able to handle its problems than the locally-owned company?

How much chance would the universally-owned company have in such contests? None at all. It would be in a hopeless position and meekly surrender!

I fully believe that local influences are worth while in cities under 50,000 people.

As I have often said before, the Bell concern has all it can do to finance the needs of New York, Chicago and numerous other large cities. All of them need many more millions than they can get.

As a general financial principle, it would pay the Bell company to sell out in practically every community of 50,000 and under, give the plant over to local capital, and remove the present financial restrictions which seem to exist among banks and financial institutions against local telephone industries.

Such a banking condition may not really exist. But it almost seems to.

There is no better opportunity for a good investment than in the telephone business, but almost every other industry gets more consideration from financial circles.

I am a firm believer in constructive principles, when such principles can be practiced. I would like to see every share of telephone stock pay a dividend. I believe every share of telephone stock could earn a dividend if we get down to busines principles.

And sound business principles mean only and simply those means by which it earns an honest profit for its investors or stockholders.

I don't think the people will object to a telephone company earning 6 per cent., together with a reasonable allowance for depreciation, or even 8 per cent.

Somehow, the public has still the idea that the telephone business is extraordinarily profitable.

Very few stockholders in telephone securities have found that to be the case, although, generally speaking, they have gotten fair returns.

Those who bought stock which paid no dividends have been too proud to admit their disappointment and have not taken the public into their confidence.

Besides, every rascally stock-selling concern widely advertises that nothing ever was so profitable as original Bell telephone stock.

If there ever was a time in history when peace and harmony should prevail among business interests it should be now, among telephone men.

I wish that the telephone men of today, both Bell and Independent, would realize the necessity of putting their houses in order, heeding the call of prsent conditions, so that we all might resist the common enemy.

I presume I am safe in calling the public a "common enemy." That may be a little far-fetched, but I am very sure that we are happier today than we would ever be under municipal, state or government ownership.

I am in hopes that all factions existing among Independent telephone men may be brought together at this convention. This is no time for civil strife.

At this time, I see no great need of a Moses or a Daniel, or any specific leadership. All we need is the leadership of a plain old gentleman called "Common Sense."

During this convention I should like to see, as an individual, not as self-elected advisor to the universe, some endorsement given to the Interstate Commerce Commission, in some form or other—at least an indication to them that we believe in them in our warfare against discrimination.

I believe the Independent convention should indicate its readiness to give the commission whatever information or knowledge its members might seek.

There is another thing on my mind, regarding the personnel of the directors of the association for the coming year. You may not agree with me, but I feel that for once in the history of the association, there should be an exclusive operating board. In other words eliminate manufacturers and other extraneous activities and compose it exclusively of operators.

Another thing, the small operator should be given a chance. Heretofore, we have always thought that representatives of the larger companies alone should be given consideration.

It may be that the representatives of the larger companies have more weight and influence, but, at the same time, they are likely to have more caution or conservatism to hold them back.

The man who has little to lose always has the maximum of daring. You are likely to get more action and more bravery out of the operator of a small property than out of the big one.

I do not mean any particular disrespect to the larger companies, but I believe it is time to make a change, and why not start something new?

It is a matter of history that the relations between the smaller Independent companies and the larger ones have not been friendly. In many ways, this feeling has driven more than one Independent company to take Bell connections on its switchboard.

Let us give the small operator a chance to see some of the big problems with which the big companies have to contend.

Another thing that should be cleared up is the membership in the association. I believe that any company, independently and locally owned should be eligible to membership, regardless of what connections it has. It strikes me that the only people not eligible to the association are the direct licensees of the Bell organization.

A sub-licensee, with nothing but a long distance contract, with freedom of purchase in the open field, surely is entitled to be classed as "Independent." What else is he?

If the church rigidly fired every sinner, its membership would soon be limited to a lot of old ladies, or the church be sold for debt.

The rumble of regulation and municipal ownership is heard on all sides. If we refuse to heed its warning, we will have to pay the penalty!

Let us hope that 15 years of Independent telephone experience will not be engulfed in the rushing wave of popular discontent. We are at least entitled to some reward!

Independent telephone interests have wrought great things! Let them not get reckless and call for the sacred vessels from Jerusalem!

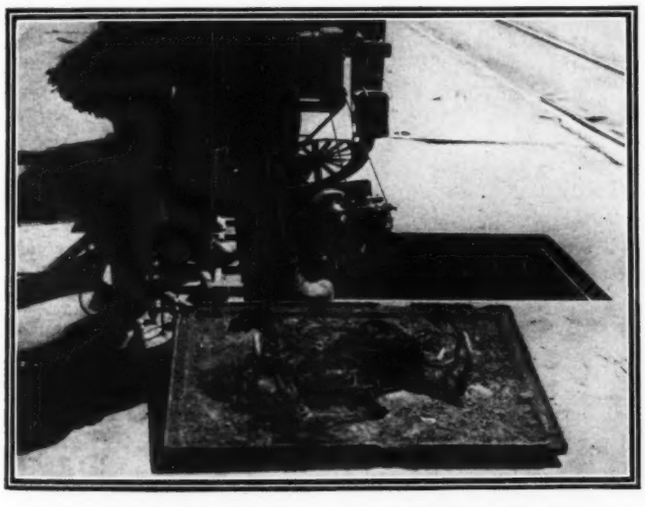
Then there will be no fingers of a man's handwriting over against the candlestick, upon the plaster of the wall of Independent success!

I hope that if we are ever weighed in the balance of public opinion, we will not be found wanting!

MORAL: Keep your ear to the ground!

Electric Fan Aids Telephone Cablemen.

One of the telephone companies in Los Angeles, Cal., has provided electric fans for the comfort of its men when they are working on underground wires in a manhole. In the summer months, work of this sort is almost unbearable



Underground Cable Men Use Electric Fans in Summer.

in the caverns below the street level where the air cannot circulate. The telephone company believes that its service is made more efficient by courteous treatment of its workers. Hence an electric fan is placed by the edge of the manhole at such an angle that the cool air will blow down upon the man at work.

Los Angeles, Cal. L. M. Edholm.

Checkmating the "Put-Off."

In collecting delinquent telephone accounts the great thing to overcome is the "put-off," writes John D. Pugh, treasurer of the Federal (Buffalo, N. Y.) Telephone & Telegraph Co., in the company's weekly Bulletin.

"I'll look this over and mail you a check," is the standard excuse. The delinquent knows the collector lives in the same town and thinks that really there is no hurry about paying the account.

To accelerate the payment where the "put-off" is to be reasonably anticipated, the collector should start to receipt the bill with an air which plainly says, "You are one of the men who always pay me."

If he hesitates pull out your cash book and start to enter up the collection on it. If, in the face of all this, he acts very much as though he was not going to pay, it is the best plan to avoid catching his eye and be very busy with the recording of the transaction, when, almost invariably, he will make at least a partial payment.

If you see he is still deliberating on just what excuse to make it is well to forestall it by giving the conversation a twist to some neutral subject of interest not in line with collections. But never let him think for an instant that you expect anything but the cash. Try it.

The Work of Rats.

For many weeks the private telephone system installed is one of the largest and best-equipped printing offices in Canada had not been giving the service called for by the contract, says a writer in the Canadian Engineer. The electrical contractors, in accordance with the agreement, searched for many days without even a clue. Outside of the fact that there was a short circuit on the line from the battery case, nothing could be secured, but first one instrument and then another would fail to respond or cross with another, or would work with complete satisfaction for a day or two, then drop off.

The cable was of the standard construction, wherein all the wires, insulated with cotton, wax covered, are enclosed in a cotton covering, also waxed. This covering was, in the estimation of rodents, entirely suitable for use in home construction, and they removed the covering from every wire for a distance of about 14 inches, and the copper wire bears many indentations of their teeth. In their effort to remove the covering many of the wires were twisted around each other, and this, of course, was responsible for the ineffective operation of the system.

This illustration at once suggests the question, "Are many of the fires now laid to the cause of "defective electric lighting" due to these rodents removing the insulation from electric light wires in the same manner?"

Walt Mason on the Telephone.

It is indeed a wondrous thing, this modern telephone, that will across the distance bring a speaker's lightest tone. Sometimes I sit and contemplate its weird, surprising plan, and bless the scientist so great who gave this boon to man. And then again I rant and bawl about its many faults, and tear the blamed thing from the wall, and on the pieces waltz. Your mirthful lips are stricken dumb, sealed are the founts of song, when central (busy chewing gum) gets all the numbers wrong. I sometimes wonder what we'd do if we should lose our phones. We'd be a hopeless, helpless crew! We'd fill the world with groans. To get back to our fathers' ways would fill our souls with aches! A message then would take three days, that now a minute takes! And then again it seems to me that life would be more gay, if all the telephones that be were burned or shipped away. For when in haste I'd use the phone to gossip with my frau, I hear stern central's monotone: "The line is busy now!" It is a nuisance and a boon, a blessing and a curse; perhaps they will improve it soon, perhaps they'll make it worse. —Walt Mason.

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Automatic In Canada.

The provincial government of Alberta, Canada, has awarded a contract to the Automatic Electric Co., Chicago, for the installation of automatic telephone equipment to be installed in the public exchange in the city of Medicine Hat.

The contract provides for the installation of 2,000 lines of central office equipment and 2,000 telephones, with an ultimate power plant for 5,000 lines. The manufacturing of the automatic apparatus for this exchange has been started and the installation will be made at an early date.

The city of Medicine Hat is growing very rapidly and, in all probability, orders for additional automatic equipment will be placed for installation in this exchange prior to the completion of the original installation.

The provincial government of Alberta owns and operates a large percentage of the telephone systems in the province of Alberta and the installation of automatic equipment in the city of Medicine Hat will be the fourth installation of automatic equipment made by that government for public exchange service. Other installations have previously been made in the cities of Calgary, Lethbridge and Strathcona, in addition to which the city of Edmonton has also had in operation for several years a municipal automatic exchange.

The decision of the government to install automatic equipment in the city of Medicine Hat may be directly attributed to the satisfactory results produced by automatic equipment in the other exchanges operated by the government.

The Year's Developments in the Manufacturing and Selling Branches of the Telephone Field

New devices which have recently appeared on the market, or which will shortly be offered—further commercial expansion of well known equipment, apparatus, appliances, etc.—accounts of notable installations—enlargement of pole and cross arm, motor truck and other industries.

The following pages afford an interesting indication of the multitude of features which will be shown at the National Convention in Chicago next week at Hotel La Salle.

The Automanual and Its Development.

By J. G. Mitchell, Sales Engineer.

In the modern development of industrial and social affairs, means of transportation and communication are being called upon to a greater and greater extent daily. Results that would have been considered not only satisfactory, but excellent, a few years ago are now obsolete, due to the onward march of progress. Time and energy must not be consumed in any of the incidental activities of modern life to any greater extent than is absolutely necessary. We begrudge the time required to travel from place to place and, as a result, our means of transportation have become, as far as it is possible for them to become, institutions equipped with all the facilities of an ordinary business office.

Development along these lines is not originated in the beginning by the corporations that furnish the service, but is based upon the demand of the public for greater economy in time and energy, and is instituted with the selfish motive of securing and retaining the public support.

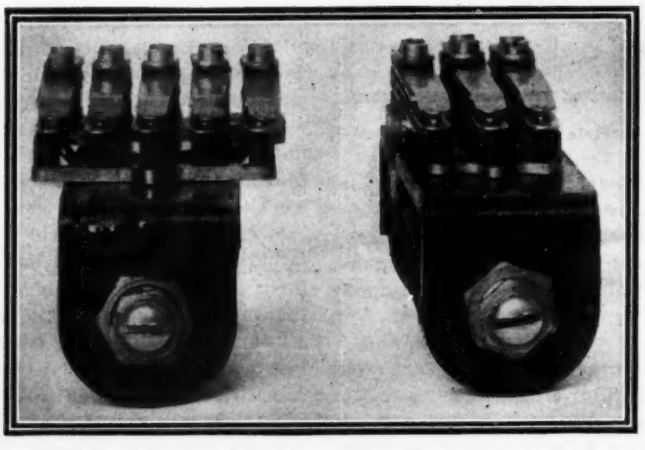
While this condition applies especially to means of transportation, it is also present no less prominently in means of communication. The mail service is maintained at its present high state of efficiency only because the business world demands efficiency. The telegraph companies must continually improve their service in order to meet their competition, and especially must the operating telephone companies incorporate the widest improvements and the most efficient methods to assure the public's support.

Telephone service 15 years ago was considered one of the most wonderful achievements of electrical science, but, as we look back in the light of present development, the service furnished at that time seems to have been very crude and unsatisfactory. The establishment of a connection under which a conversation might be held, was considered satisfactory, although such a connection was not established in a period of seconds and the telephone user was required to perform a not inconsiderable amount of manual labor in order to secure it.

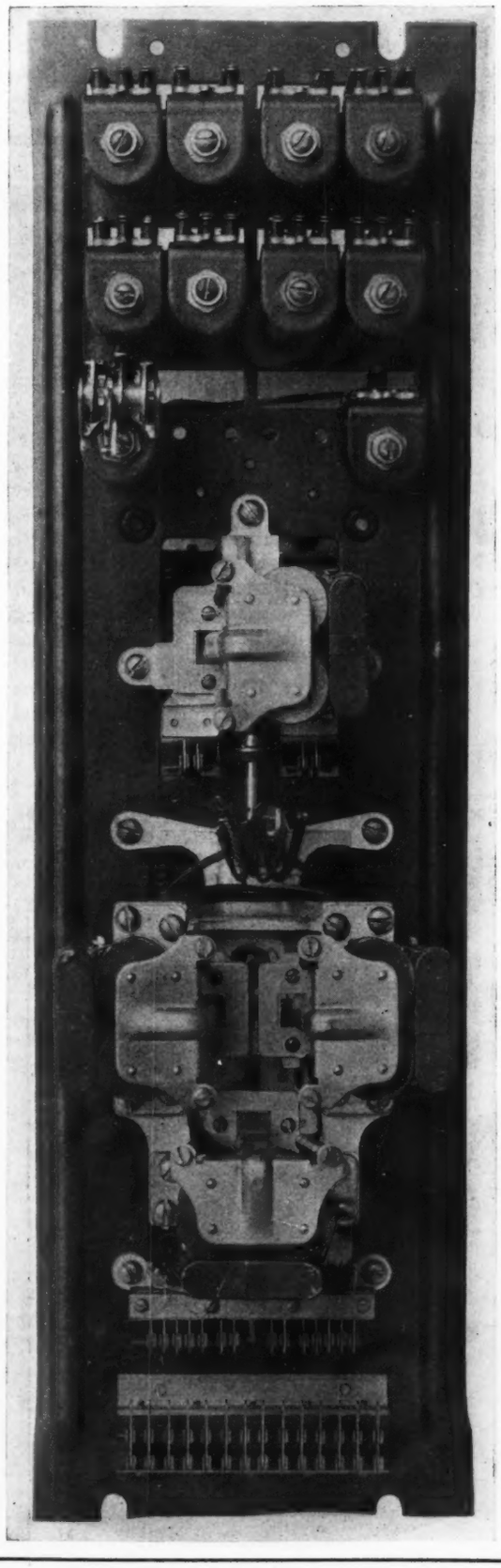
A New Profession Created.

With the appreciation on the part of the business world of the great utility inherent in the telephone system, quicker and quicker service was demanded, the elimination of the manual effort upon the subscriber was insisted upon and the extension in miles of the limits of practical conversation became a necessity.

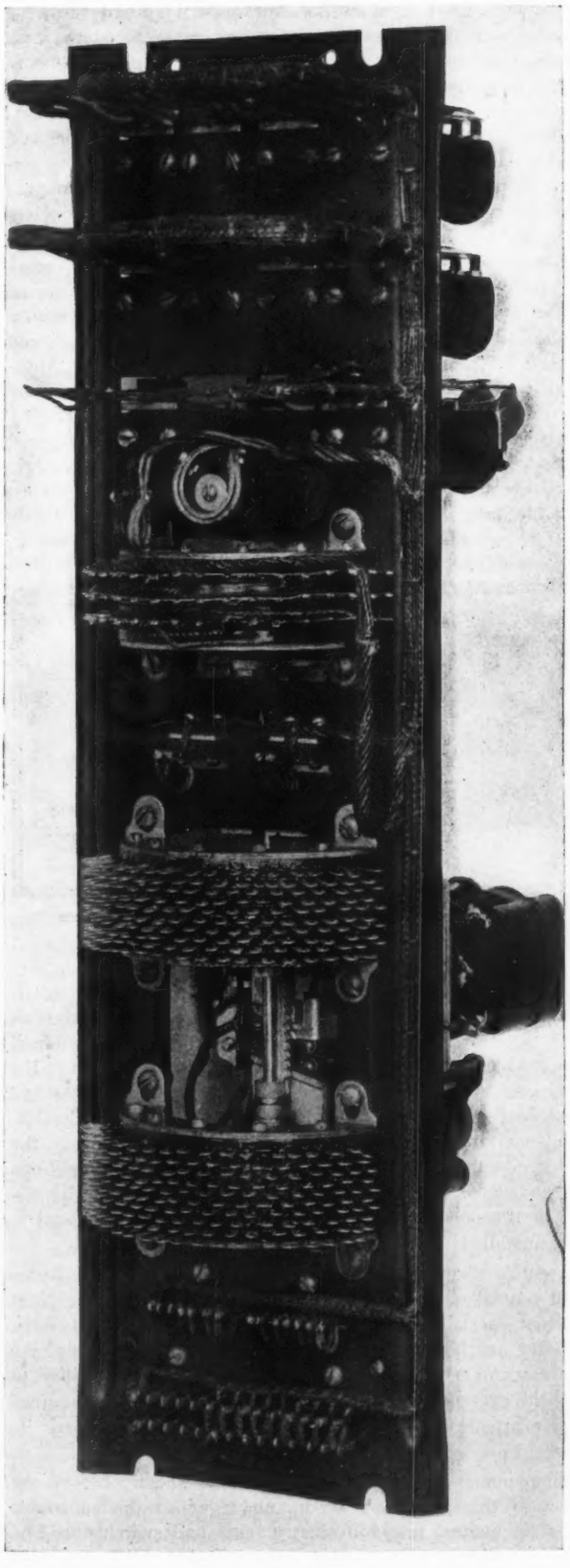
The demands of the public upon the operating telephone company forced the development of a new profession, the telephone traffic engineer and telephone traffic, a term which was practically unknown fifteen years ago, became the subject of the most exact scientific analysis. This analysis in a very short time indicated clearly that certain radical improvements in service which were even then being demanded by the telephone using public, must be installed and that the existing forms of telephone apparatus available must be tremendously improved in order to render possible the desired improvements in service. In conformity with the progress along other lines, the personal element in the handling of telephone connections was to be eliminated to the greatest possible extent for the purpose of securing greater accuracy and reliability. The industrial world has found that operations which are similar and often



Five and Three Spring Arrangement, Automanual Relays.



Front View of Automanual Connector Plate.



Rear View of Connector Plate.

repeated are more satisfactorily performed by mechanical methods and agents than by manual means.

The Automanual system, invented by Edward E. Clement, is the result of efficiency engineering to meet modern traffic conditions. This system was taken over some years ago by the North Electric Co. of Cleveland, Ohio, an old established telephone manufacturing firm, and the mechanical construction of the Automanual switching apparatus was thoroughly revamped and refined under the able guidance of Chas. H. North, president of the company.

Very early in the course of Mr. North's labors, it was found that the equipment used in the Automanual system could be successful only by the adoption of the most accurate form of mechanical equipment and the necessary tools for producing in large quantities the parts which must be exact duplicates to the utmost refinement of mechanical skill. The enormous expenditure for tools was justified in the resulting product and the Automanual switching equipment has been carefully examined by the most discerning telephone engineers who pronounce the apparatus superior to any other mechanical devises used in the telephone art.

The enormous prospective demand for Automanual equipment attracted capital and the result was a reorganization of the sales and manufacturing departments. At Galion, Ohio, a magnificent modern factory was erected, thoroughly equipped with new machine tools designed especially to turn out Automanual equipment with the greatest possible degree of percision under ideal conditions for the workmen and operating under the most efficient methods known to factory experts. The modern architectural refinements of this factory were laid out and erected under the supervision of R. W. Robins, consulting mechanical engineer and factory expert.

Welfare conditions for employes have been emphasized to

Adjustable Balance Impedance Coil.

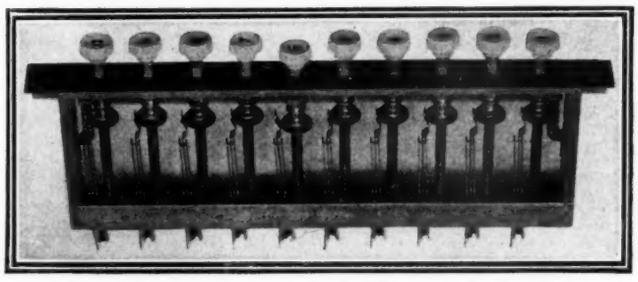
the greatest possible extent. The lighting facilities are excellent, steel frame window sashes permitting the installation of a large percentage of glass in the side walls of the building. An isolated electric power plant with individual drive for the various groups of tools with the most advanced grouping and arrangement of the large tools, and the assurance of healthful and sanitary working conditions for employes, insure the future production of Automanual equipment under conditions which guarantee a continuance of the satisfactory results obtained in the operation of plants in which the Automanual is already installed.

The entire plant is devoted to the production of the Automanual central office equipment. All the facilities in the plant have been specialized on this one object, due to a thorough realization on the part of the management of the Telephone Improvement Co. that excellence of result and the ability to render the present high standard of telephone service required exclusive attention to the production and refinement of its product.

Arrangements were made at the time or shortly before the erection of this plant was begun, under which the enormous business in manual telephone instruments and switchboards of the North Electric Co. should be handled by the Cracraft, Leich Electric Co. of Genoa, Ill. To this end and in order to enable strict specialization on the Automanual equipment, all of the manual stock, together with tools, dies, drawings and engineering records pertaining to manual equipment were turned over to the Cracraft, Leich company.

The prospects for the current year indicate that even the modern plant at Galion will be taxed to the utmost to supply the demand for such excellent result-producing equipment as the Automanual.

The opening of the general offices of the Telephone Improvement Co. in the Monadnock Building, Chicago, places the sales organization in touch with the very center of the tele-



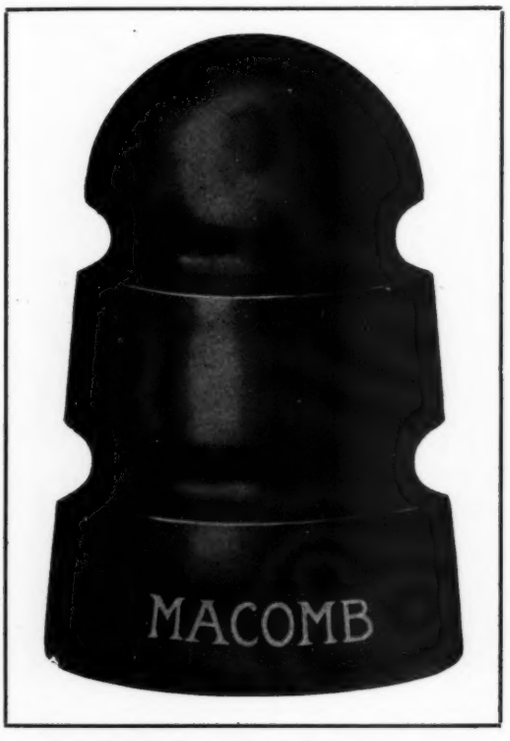
One Digit of Automanual Operator's Key.

phone world. The establishment of a branch office at Cleveland, Ohio, in the American Trust Building, enables the Telephone Improvement Co. to retain its close and intimate contact with the telephone development of the eastern part of the territory. By the engagement of Harry G. Webster as chief engineer, patrons of the Telephone Improvement Co. are assured of securing every advantage in refinement of circuit design that is compatible with the most conservative standards.

Opposition to the march of progress is of absolutely no avail and the management of the Telephone Improvement Co. is convinced that, in the production of the Automanual system, they have placed themselves in phase with the inevitable advance in methods of furnishing telephone service.

Porcelain Pony Insulators for Telephone Lines.

The necessity of well insulated telephone lines is now conceded by telephone managers as one of the essentials for sup-



The Pony Porcelain Insulator.

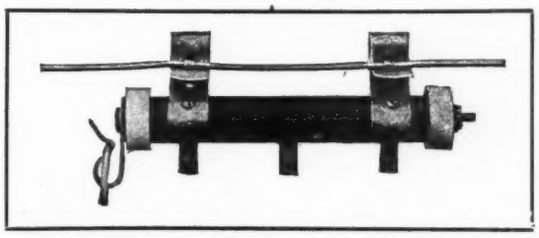
plying good service. A poorly insulated line will not stand up under various weather conditions. The value of porcelain as a material for telephone line insulators is being recognized by telephone companies, especially for use on their longer circuits.

Porcelain insulators are said to increase the insulating efficiency of a line to a considerable degree. It is said that porcelain insulators do not condense moisture from the air, so that there is comparatively little leakage between telephone circuits and also to the ground. The insulator shown in the illustration is manufactured by the Illinois Electric Porcelain Co. of Macomb, Ill., and is of a size such as is commonly used for telephone lines.

Reliable Electric Company's Specialties.

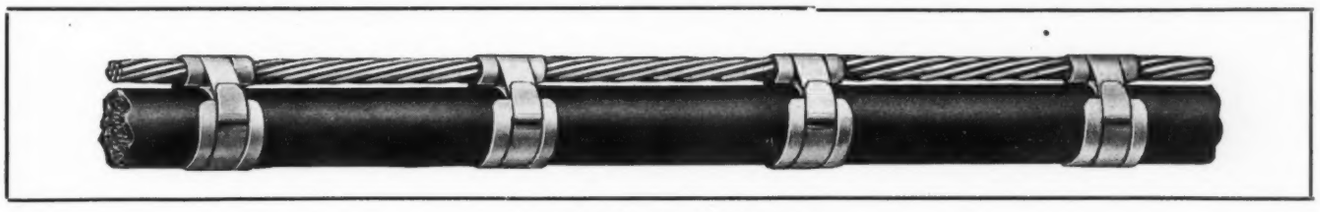
The Reliable Electric Co., of Chicago, rounded out the third year of its corporate existence last December and the officers declare that each succeeding year has been better and bigger than its predecessor. They believe that the current twelve months will outstrip anything in their history in the amount and quality of business done. The company's line of specialties is large and includes many things of peculiar interest to telephone men. Those who are not familiar with the Reliable products will do well to have their names placed on the company's mailing list, to receive its literature.

The organizers of the company were F. W. McMeal, G. W. Rodormer and O. C. Junge. They are its officers. F. W. McMeal, president of the company, had been for over 12 years general superintendent of the American Electric Fuse Co., of Muskegon, Mich. While with this concern, he improved many of its specialties and was able to add materially to the number of protective devices made by the company. Mr. McMeal is a firm believer in the principles of scientific management and the latest and best equipped machinery is found in his present factory. At the time of severing his relations with the American Electric Fuse Co., Mr. McMeal had 450 people under his supervision, and many of these joined his force with the organization of his own company. They have been big factors in promoting the rapid growth and success experienced by the Reliable company during the past three years. G. W. Rodormer, secretary and sales manager, was for a number of years in charge of sales for the American Electric Fuse Co. O. C. Junge is the youngest member of the company. His specialties are those of the electrical engineer and designer. He just recently developed the Reliable horse clipper (here shown), which has a big field among the electrical jobbers and hardware dealers. Mr. Junge is constantly on the lookout for new ideas which can be developed by his company. He gives this feature of the company's business special attention and is continually on the alert for meritorious inventions.

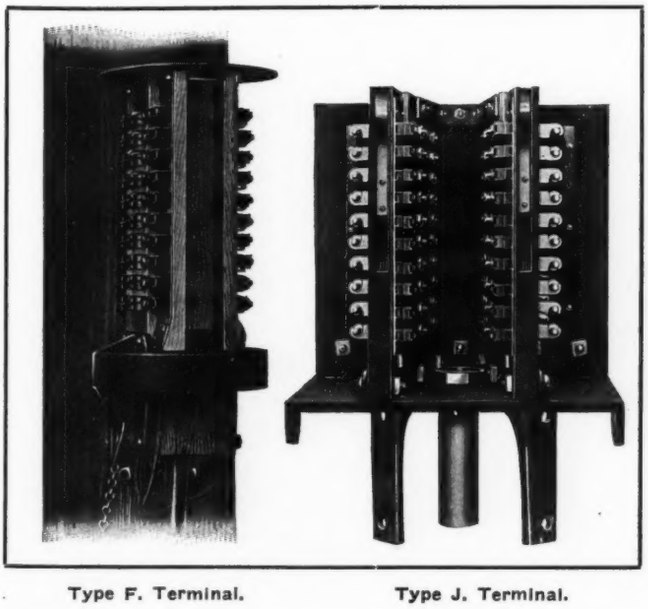


The No. 700 Reliable Line Arrester.

The company's first factory site and space were thought to be ample, but soon proved to be the contrary. It was realized at the end of six months that more space was necessary. Additional floor space was procured, but this likewise proved to be inadequate. At present the company occupies commodious quarters in a modern factory, 411-417 S. Sangamon street, Chicago, and is in position to handle a big volume of business. The number of specialties made by the company has been increased considerably, and the line now embraces fuse strips, wire and links, glass fuses, fuse blocks, pencil fuses, steel and copper sleeves, cable hangers, porcelain fuses, cable terminals, baby knife switches, distributing frames, cable joints, test connectors, heat coils, etc., etc.



The Davidson Cable Hanger.



Type F. Terminal. Type J. Terminal.

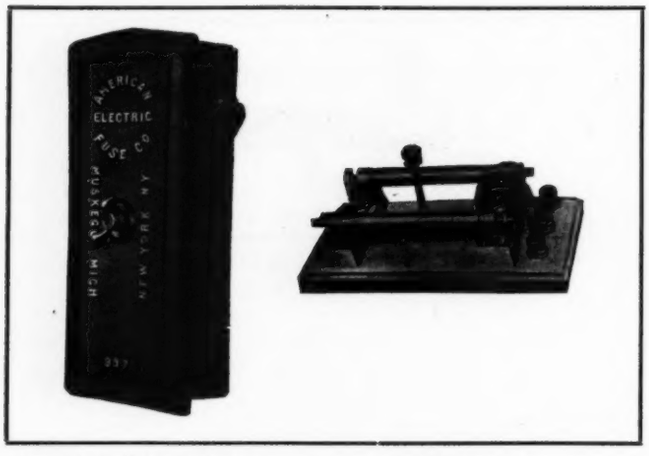
Several of the leading specialties are here shown. In conjunction with the factory an experimental laboratory is maintained for the development and improvement of new ideas. Before any Reliable product is shipped, it is carefully tested as a precaution and a guarantee of future good service for the ultimate user. The company's business has so increased in volume that it is now filling orders received from all parts of the world. Some of the largest telephone companies are included among its patrons. Mr. Junge says, "It is especially gratifying that our repeat orders contribute to form the biggest portion of our business."

Among the new products of the Reliable Electric Co. are the Davidson cable hanger; the types F and J terminals; the Nos. 700, 880 and 997 arresters and protectors; the No. 000 test clamp; and the No. 452 Baby knife switch.

The Davidson cable hanger is made of non-oxidizable flexible metal, such as zinc, so that it does not rust or corrode. It is simple in construction, as shown in the illustration. In placing it several turns are taken around both cable and messenger wire and the hanger is locked in place by the weight of the suspended cable which is at a uniform distance from the messenger wire. The hanger can easily be attached without the use of tools.

The types F and J cable terminals are shown in the illustrations without covers. These terminals are adapted

for use with cables varying from five pairs to 50 pairs. The type F is a mica fuse and carbon lightning arrester cable terminal. The fuse terminals are mounted on a moisture-proof wood base, which forms a box enclosure, into which the cable is brought from the bottom and



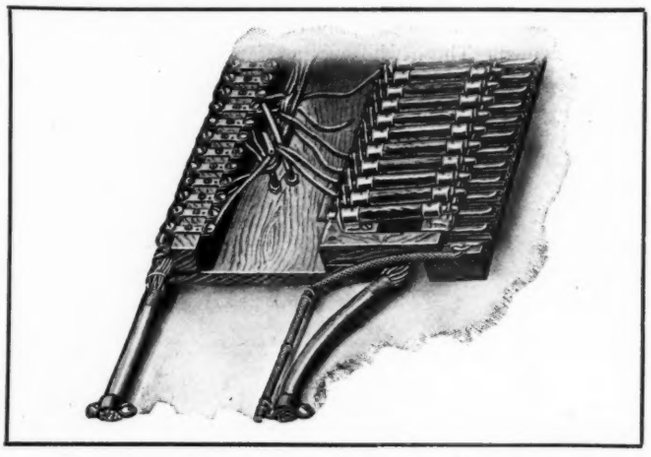
No. 997 Station Protector. No. 880 Arrester.

fanned out to the various terminals. The cable is prevented from slipping out of the terminal by a clamping arrangement of the blocks at the bottom. Moisture is prevented from entering the cable by completely filling the enclosure with an insulating cable compound. This has a high melting point so that under ordinary temperatures the compound, after being placed, is not liable to be disturbed by temperature changes. With the type J terminal a pothead is required to bring the cable conductors out into the terminal. The fuse strips are arranged in the form of a "V" for convenience in making changes. Reliable, hook type, fuse contacts and individual carbon mountings are features of this terminal.

The No. 700 arrester is intended for use out on the line and can be attached to the wires without cutting them. As shown in the illustration, the arrester is made up of a brass shell in which is placed a carbon rod insulated from the shell and connected with ground. Fahnestock clips are attached to the brass shell and make connection with the line wire. The use of these clips permit the protector to be easily detached from the line wire for inspection without disturbing or cutting it. The shell and carbon rod are 5¼ inches long, with an air gap practically the entire length, thus providing a large area for the lightning to discharge across. No iron or steel being used in the construction of the arrester, there is no danger from rust.

Three vents, projecting downward, are provided in the brass shell. When a lightning discharge takes place, any dust which may be in the arrester is sifted out from the shell by the swinging of the line wire. The construction and method of installation of the arrester is said to render it absolutely waterproof. By means of the line arrester, lightning striking the line is conducted to ground before it has an opportunity to enter a building.

The No. 880 station arrester is intended for use inside buildings, as near the line entrance as possible. It is made up in accordance with specifications of the National Board of Fire Underwriters, and consists of tubular fuses and a carbon lightning arrester mounted on a porcelain base as shown in the illustration. A metal cap is placed

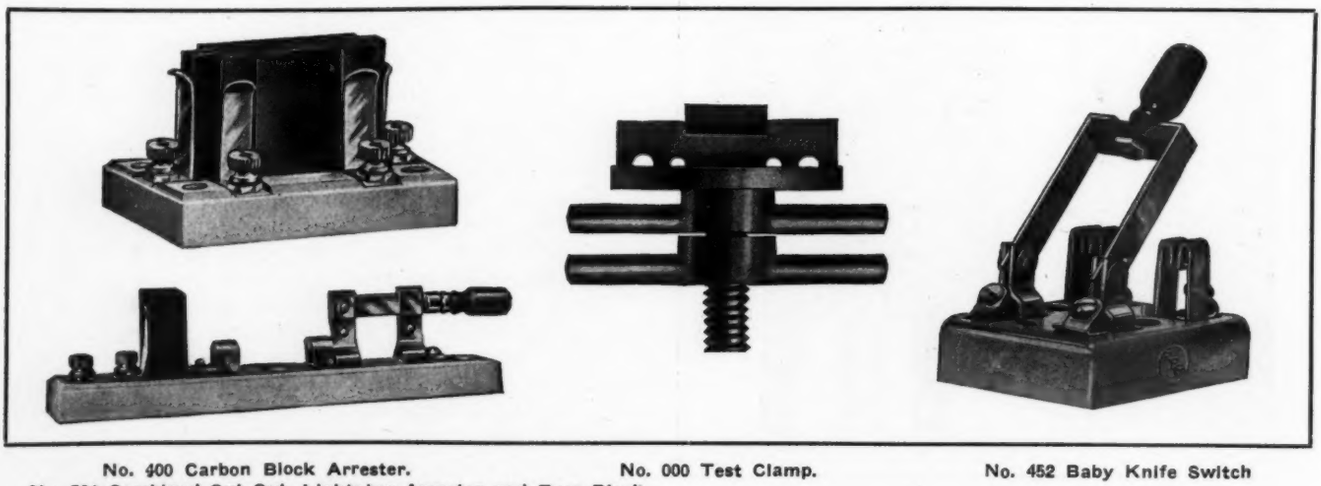


No. 130 Board Type Protector for Small Exchanges.

over the carbon, although a glass cover may be substituted if desired.

The No. 997 station protector is designed for out of door use. It consists of porcelain tubular fuses with a large, self-cleaning carbon lightning arrester. These are mounted in a porcelain box-shaped receptacle provided with an iron cover having a rubber gasket. The cover has overlapping edges as an additional preventative against moisture entering the protector.

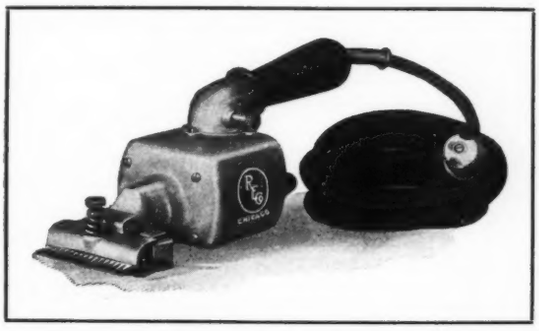
The No. 000 test connector or test clamp is made of copper with the exception of the bolt and thumb nuts, which are of brass. As shown in the illustration, the feature of this test connector is the provision of an extra thumb nut for locking purposes to prevent the holding thumb nut from working loose.



No. 400 Carbon Block Arrester. No. 000 Test Clamp. No. 452 Baby Knife Switch
No. 501 Combined Cut-Out, Lightning Arrester and Fuse Block.

The No. 452 Baby knife switch is simple in construction, and yet durable in use. The knife blades fit tightly between the spring clips, thus assuring good contacts at the connecting points.

The Reliable company also manufactures multiple mica fuse protectors and lightning arresters. The No. 131 protector shown in the illustration is of the board fuse type, occupying but little space, as it is intended for mounting upon the wall. The cable conductors terminate on the back of a hinged cover, so that they are readily accessible when occasion demands. The board type protectors are equipped with fuses only; lightning protection only; or may be obtained in a combination fuse strip and lightning arrester type.



Reliable Horse Clipper.

The Reliable Electric Co. purchased the entire manufactured protective telephone equipment and raw material of the defunct American Electric Fuse Co., of Muskegon, Mich. Many telephone men and purchasing agents, who formerly bought the American Electric Fuse Co.'s equipment, will be glad to know that they can secure parts for such apparatus from the Reliable company, as it is now manufacturing the entire line that the American Electric Fuse Co. formerly produced.

Satisfactory Business Reported by Runzel Lenz.

Satisfactory business for 1912 is reported by the Runzel-Lenz Electric Mfg. Co., of Chicago. This concern specializes and concentrates on the manufacture of cords for various telephone uses. Its factory is equipped with the latest improved machinery and, it is declared, is second to none in facilities for the manufacture of the best possible cords. Runzel-Lenz cords, assert those who use them, make staunch friends wherever they go.

In the January 25 issue of TELEPHONY the following news item appeared, which is of particular interest to the Runzel-Lenz company:

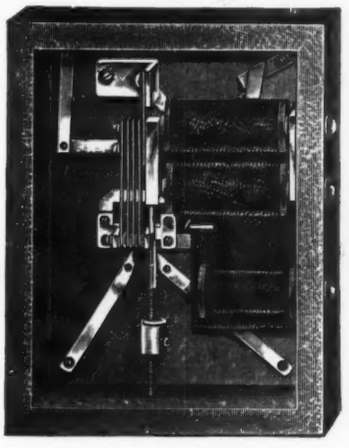
The Factory of the Runzel-Lenz Company.

"Thirteen telephone calls a minute were answered by the Home Telephone company's operators at Elkhart, Ind., during 1912. A total of 7,031,232 calls was answered on week days and 817,496 on Sundays. Over 811,000 connections were given over the free service lines to points outside of Elkhart and 30,489 long distance calls were recorded. The local calls during the year numbered 6,642,939, according to the manager's report."

The Home company, of Elkhart, uses Premier B. B. steel conductor switchboard cords exclusively. These are manufactured by the Runzel-Lenz company, and this item, indicating the heavy service which they sustained last year at Elkhart, is properly considered by the company as a valuable testimonial to their worth.

A Pole Changer Worth While.

Charles R. Barrett, president of the Current Electric Co., Chicago, advises TELEPHONY that the year just closed has been one of the best he has ever known for the Standard pole changer, which he designed several years ago, and the sale of which has been steadily growing.



The Standard Pole Changer.

Being very simple in construction, the Standard pole changer is said to be free from complications in its use and exceptionally efficient. It requires no adjustment, giving very satisfactory results on alternating, direct and pulsating current ringing. It uses little current. One set of 40 or 50 dry cells will operate it for over a year.

The Current Electric Co. has been making the Standard for nearly 10 years and has improved it materially from time to time. It is now stated that the instrument is practically trouble proof and absolutely dependable. The moderate price at which it is sold is another element contributing largely to its popularity.

Mr. Barrett states that he expects 1913 to be a year of unprecedented expansion in the sale of the Standard pole changer. He desires inquiry from any telephone company interested in the subject of pole changers to which he will be glad to mail full descriptions of the Standard, together with prices.

Changes in Matthews Staff.

W. N. Matthews & Bro., St. Louis, announced that John L. Fay has again associated himself with them as sales engineer, with headquarters in St. Louis.

Mr. Fay left W. N. Matthews & Bro. in April, 1912, to take the position of superintendent of wire, with the Milwaukee Railway & Light Co. This position he accepted at the request of S. B. Way, vice-president and assistant general manager, for whom he formerly worked in the same capacity, when Mr. Way was chief engineer of the Union Electric Light & Power Co., of St. Louis.

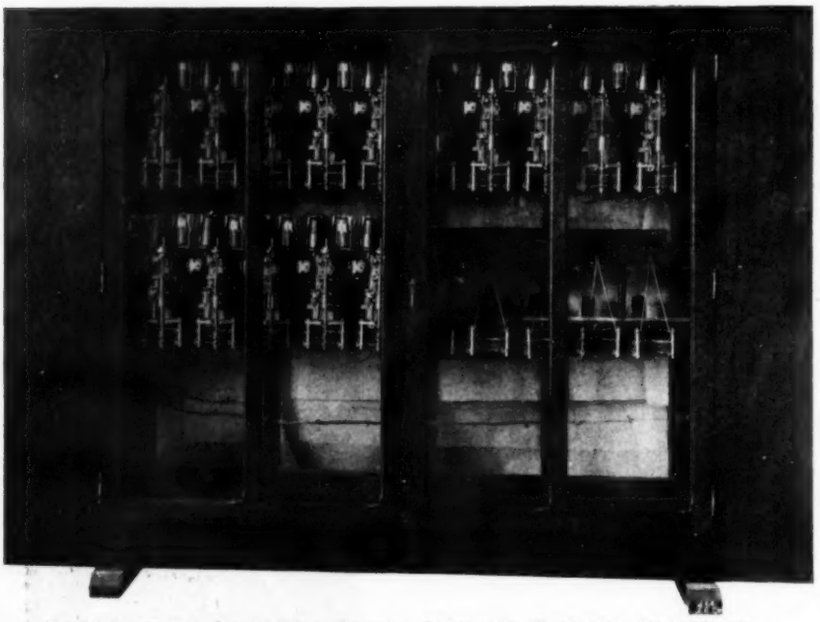
Mr. Fay is an expert on overhead light and power distribution and all of the devices that appertain thereto. W. N. Matthews & Bro. state that they will be very glad to have any of their customers take advantage of this knowledge and write him for information regarding problems which may confront them.

W. N. Matthews & Bro. have accepted the resignation of Benjamin C. Chase as their representative in Los Angeles and have turned over this territory to Louis E. Sperry, who represents them in San Francisco. This now gives Mr. Sperry the entire state of California as his territory.

Automatic Private Branch Exchange Operation.

By John H. Findley.

A large proportion of all business telephones in the larger towns are connected to private branch exchanges. The subject is, therefore, of vital importance to all business men, and telephone men especially. A great many companies and institutions have found it economical, and



Front View of the 30-Line Private Automatic Exchange Switchboard.

entirely practical to use a private so-called intercommunicating telephone system in addition to or in conjunction with the regular rented telephone system.

A large number of these private systems are arranged to be connected by cable from one station to another, each instrument having all wires for the entire system connected to it. This arrangement is believed by many to be cumbersome, expensive, hard to maintain, and more or less unsatisfactory, inasmuch as the majority of these systems are not arranged for secret service, any one being able to get in on a line while other subscribers are using it.

To meet the demand of equipment for service of this kind in a practical way, The Automatic Electric Co., of Chicago, developed its 100-line, unit type board. These boards met with remarkable success from the very first. There are scores of them in use today located all over the known world and working under almost every conceivable condition.

These boards were first used in conjunction with automatic telephone systems in outlying districts, being connected by trunk lines with the main automatic boards. Later they were used in conjunction with manual boards. They were located in congested districts and operated automatically to the subscribers in that district, and over trunk lines to the manual operator at the trunk position. One operator often was able to handle the calls for several hundred lines, as the majority of the business was local and automatic.

Still later another arrangement of these boards was made whereby it was possible for all automatic subscribers at the isolated points to ring the manual operators direct. This was accomplished by multipling the regular subscribers' lines from the manual board through the switch banks. Thus only manual calls to automatic boards were left for the operator to call and supervise.

Many manual exchanges are now being gradually cut over to automatic, working in this way, and, it is claimed, the saving in operators' salaries soon pays for the equipment required. The profit of the companies advances, notwithstanding the increase in number of subscribers, which naturally increases the cost per subscriber, and that in most places the Independent boards are now operating on a far lower margin of profits to the company and cost to the subscriber than the Bell boards.

When the larger business houses saw how well these rented isolated small automatic boards were working out wherever installed, they insisted on having a chance to use them in districts where the rented systems were not available. Although the sale of these boards was for years discouraged by the Automatic Electric Co. due to its feeling that these isolated boards would not receive the attention which they should have, it finally yielded to the demand and the results have more than justified the step taken.

To meet the demand of a system where it is desirable to connect two or three parties together for conference work, the new individual connector, 24-volt, 100-line boards were designed. With these boards it is possible to have all parties on the board talking at the same time. This is what is known as 100 per cent. trunking. In addition to this feature, it is possible to connect as many of these lines as desired for conference work or to secure information not in possession of the first called party.

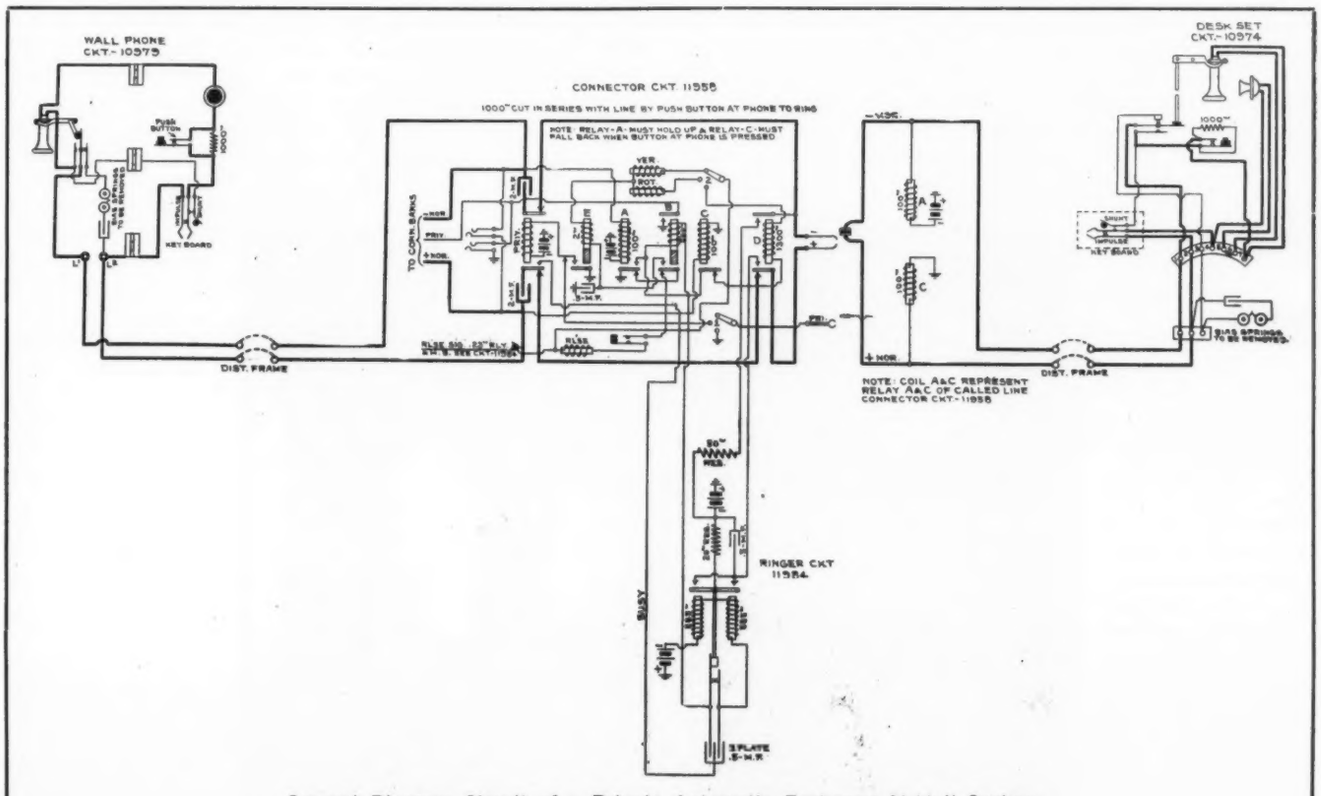
Rear View of Private Automatic Exchange Switchboard.

These connections, however, are made at the will of and by the parties using the lines so that all conversations over these lines are strictly private, no one, not even an operator, being able to listen on the line.

The process of making these connections is as follows:

Let *A*, *B* and *C* represent three parties. *A* can call *B*, then *B* can, without disconnecting *A*, call *C*, and so on around the whole board until as many parties as desired may be connected together.

Another feature of the board, which appeals to many people, is the fact of each subscriber having his own connector. These connectors are so arranged that, if a maintainer is not on hand, anyone by removing two screws and two nuts can take out a connector and replace it with another. This permits all work in connection with the maintenance of the board, to be done at regular intervals rather than having a maintainer always on the ground to repair or readjust the equipment in case something happens to it.


WALL PHONE
CKT.-10979
DESK SET
CKT.-10974
CONNECTOR CKT. 11958
1000~ CUT IN SERIES WITH LINE BY PUSH BUTTON AT PHONE TO RING
NOTE: RELAY-A- MUST HOLD UP & RELAY-C- MUST FALL BACK WHEN BUTTON AT PHONE IS PRESSED
TO CONN. BANKS
DIST. FRAME
DIST. FRAME
NOTE: COIL A&C REPRESENT RELAY A&C OF CALLED LINE CONNECTOR CKT.-11958
RINGER CKT 11584
BUSY

General Diagram Circuit of a Private Automatic Exchange 24-Volt System.

For small boards the first cost of this equipment is much less than the Keith switch unit boards. When the equipment runs up to or close to a 100 lines, the switch type is slightly lower in price than the individual connector board.

The circuit for the latter type board is shown in the illustration. It is to be noted that this is very simple, there being few relays and connections to get out of order. The circuits of this individual connector board, as now designed, are not arranged for party line ringing nor for connection to manual boards. It has been the experience of the manufacturer that, if a condition arises where any special service is required which is at all reasonable, the automatic board can be adapted to this service with very little trouble, easier in fact than a manual board in most cases.

For instance although this board is not arranged for trunking to a manual board, there is no reason why any number of individual lines should not terminate at the manual board. The position where these terminate, may be arranged with cord circuits to connect through to manual lines, the position being equipped with an automatic calling key for calling the desired parties in the regular way on the automatic board. Again, although the standard circuits are not arranged for calling party lines normally, arrangements have been made to put more than one party on a line and operate the board for party line ringing. When the Automatic company says an electrical circuit is not arranged for a certain class of service, it does not mean that the company cannot arrange the circuit for the service required, if it is necessary or expedient to do so.

An installation of this type of automatic private exchange for intercommunicating service is being installed for the Illinois Central Railroad in its shops and yards at Centralia, Ill. Several other railroads are investigating the merits of these boards and are especially interested in them for intercommunicating purposes in offices, shops and yards.

At the national convention next week the Automatic Electric Co. will have one of the boards on exhibition so that telephone men will have an opportunity to examine its various features.

Asbestos Coverings for Poles.

Since 1896, says a writer in Electricity, experiments have been made in France as to the use of asbestos sheathing to protect the butt of telegraph poles from rotting. Asbestos strips were coated with tar and laid round the pole so that the turns over-lapped. The covering was extended 8 in. above ground level and was nailed completely over the butt end of the pole. Finally, an outer band was applied to keep the asbestos in place.

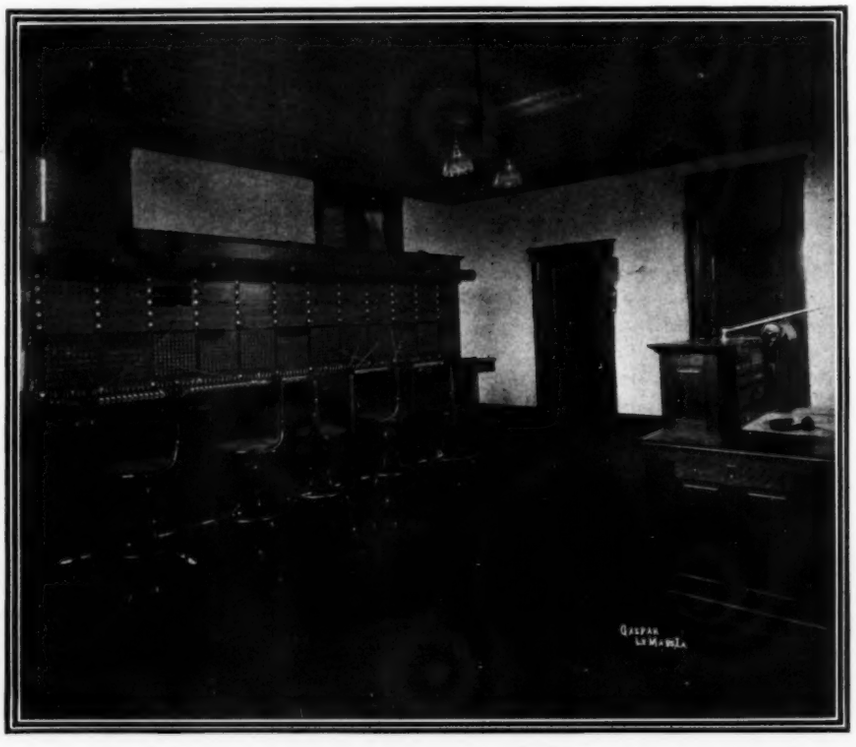
Poles erected in 1896 and protected by this system, were still in excellent condition in 1909. The cost of the asbestos covering was considerable, and, unless the poles remain in service until, say, 1920 (24 years), they will not show appreciably greater durability than poles protected by the cheaper process of creosoting. Experiments are in progress to determine whether a lighter asbestos covering will not provide sufficient protection.

What the Stromberg-Carlson Company is Doing.

By H. C. Slemin, Sales and Advertising Manager.

The story of our work during the year 1912 could begin and end with one word—progress—which is sufficient to describe its main feature. Believing the things accomplished during the past year to be interesting as well as instructive, I will present the most instructive features of the work and eliminate most of the interesting events, which pertain more to our company, individually, than they do to the developments made by us to advance the art in which we energetically engaged as a prominent Independent telephone manufacturer.

About this time last year opinions differed as to the prospects for big business during 1912, but Independent telephone manufacturers on the whole have done better than for several years. Faith in the future of a growing business and a determination to succeed has done much to make better conditions and improve trade. Everywhere the Independent exchange man has been extending telephone lines and building up the systems to meet the increasing demand wherever population is covering more area. The other prominent factor in this business is the Independent telephone manufacturers, who are always ready to share in the development work and extension of any Independent telephone system. In this work we are more than the purveyors of good equipment. We must be organizers, business managers and engineers. The brunt of this upbuilding work falls upon the telephone salesman, who, of necessity, must possess a broad, practical business and technical knowledge.



Typical Common Battery Lamp Line Multiple Board—Le Mars, Iowa.

Our sales record for 1912 was a creditable one and concluded with a largely increased volume of business over the preceding year. Subdividing our sales into various classes we find the results to be even better than is simply implied by the statement which shows an increased volume of sales. This improved showing is the result of greater effort to standardize the product, and to concentrate the sales work along clearly defined lines. Such a plan is practical even in this complicated business, and means economy for the user, as well as for the manufacturer of high grade telephone apparatus.

About the middle of last year we were able to inaugurate new sales plans that permitted us to reach out for more trade, and this gave us the opportunity to market more equipment. This has helped make a greater business with both new and old customers. Our "bargain sales" have been a part of the greater selling scheme and they have been successful because the trade has been quick to realize the values represented and the integrity of the firm introducing them.

We find the general character of business better and old territories which have always figured conspicuously as Independent states mainatined their standing throughout the year. In 27 states we show increases in business of from 10 to 300 per cent., and have experienced no extraordinary losses where the policy of the Independent telephone exchange companies has been changed, due to new ownership, political influence, etc. Foreign business has grow considerably during the past year for certain classes of equipment. This surely denotes the soundness of the business and its ability to absord local problematical affairs which have a tendency to cause some disturbances.

The engineering progress made in the development of the telephone apparatus put into service by this company during 1912 is instructive. I will, therefore, describe some typical plants. No attempt will be made to review the entire field of operations or to describe all of the development work in which we have been engaged during the year.

Our aim and principal development work has been to improve the standard common battery manual switchboard system by adding features that would make it more flexible and economical to operate. Some very practical and original ideas have been developed. The principal object of these developments is to increase the efficiency of operation and reduce the cost of maintaining the system.

We have an installation in the Park office of the Rochester (N. Y.) Home Telephone Co. which features the reduction of the required number of operators at the branch exchange and increases the efficiency of service between the branch and main exchange, especially where there is a high percentage of trunking; that is, where calls originating in the branch exchange require connections at the main office.

The following description of the operation of this branch exchange system will give an idea as to the requirements for this equipment. A line switch is provided for each subscriber's line extending into the branch exchange. These lines and switches are arranged in groups, with 160 to a group. Each group is provided with 16 trunk circuits extending to the main office and terminating in jacks, with associated lamp signals distributed before the various "A" operators at the main exchange. The branch exchange equipment is also provided with a switchboard containing a jack for each line entering this exchange, and provided with plug ended trunks extending from the main exchange, and adapted to be connected with

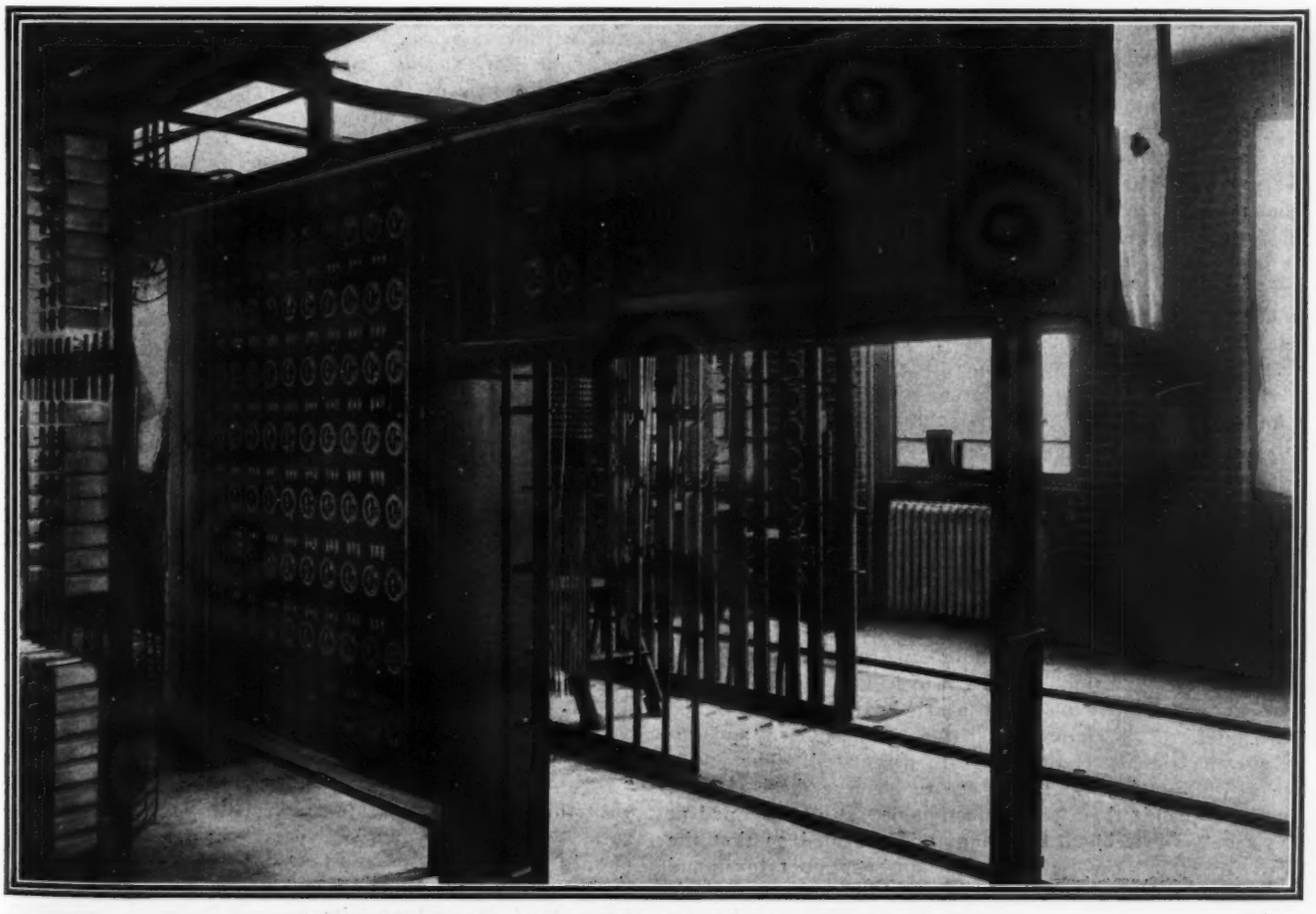
lines of the branch exchange, through the medium of these jacks. In the operation of this portion of the system the removal of the receiver at a branch exchange subscriber's station, operates the line switch and selects a non-busy trunk extending to the main exchange, there to be answered direct by the main exchange operators.

The selection of this trunk completes a circuit, which displays a signal at the switchboard in the main exchange, the same as any other signal from a subscriber's line entering the main exchange switchboard, and if the call is for a main exchange subscriber, the operator completes the connection in the usual manner. Where a main exchange subscriber desires connection with a branch exchange subscriber, the "A" operator, by the usual method, orders up the connection at the branch exchange, giving the number of branch exchange subscriber desired, and in the usual way receives from "B" operator at the branch exchange the trunk assignment. The "B" operator then completes the connection with her end of the trunk by means of the jack of the desired subscriber's line, and calls the subscriber, employing automatic machine ringing equipment.

When a branch exchange subscriber desires connection with another branch exchange subscriber, the call appears in the main exchange as usual, and this operator by the usual method orders up the so called "reverting operator" at the branch exchange switchboard, giving the number of the desired branch subscriber, and also the number of trunk upon which the call so originated. The "reverting operator" at the branch exchange is provided with double plug ended connected circuits. In handling this connection she inserts the answering end of this cord into a jack which connects with the trunk over which the call has been carried to the main exchange, and connects the calling end of this same cord circuit with the jack of the desired subscriber's line. The connection of the answering plug with the trunk jack cuts off the main exchange portion of this trunk, and removes the signal from the main exchange operator, permitting her to take down the connection, which then becomes a completed circuit in the branch exchange equipment. The main exchange equipment is entirely isolated for all connections of this character.

In the York, Pa., installation we have developed a telephone traffic distributing equipment known as "partial call distributing system." Its object is to regulate the load in an exchange so as to distribute the calls uniformly to all operators. The installation of this system first consists of seeking out and equipping with switching devices those subscribers' lines from which it has been observed that many calls originate. Usually no difficulty will be found in discovering lines from which at least 10 calls per hour are received, this requirement often extending for six or eight hours during each day.

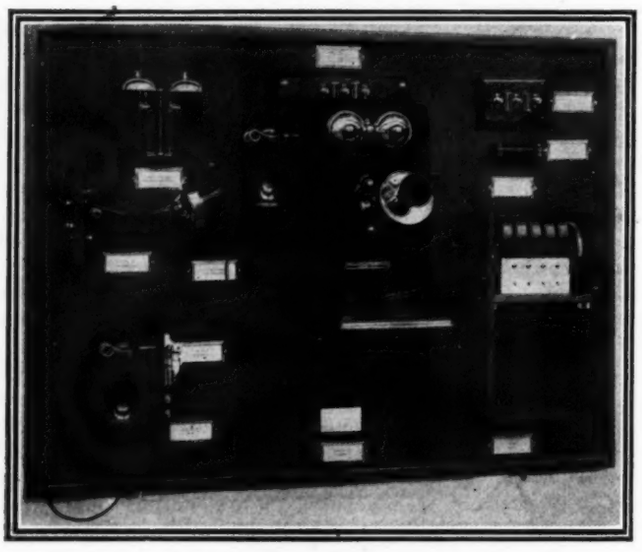
In handling the traffic problem of an exchange the difficulty is to so arrange matters that those operators located at positions where few calls are originating will be able to answer a large number of calls. In a regular manual exchange this is not permitted, owing to the absence of the calls from some positions, even during busy peak periods. Since a good number of calls are being originated during these periods, it follows that some group of operators is carrying the entire load of the exchange. It is the function of the call distributing switches connected to the lines originating the most calls to distribute them into those positions where operators are least occupied, and this is done, first, by locating the busiest lines in the exchange; second, by equipping the various positions of



Stromberg-Carlson Company's Partial Call Distributing System at York, Pa.

the switchboard with suitable apparatus, so arranged, that, when a calling lamp is lighted in one of the panels of a position, no calls will be distributed into this panel, where such calls originate from one of the lines connected to the distributing switch equipment.

The second panel of this position is also equipped with



Universal No. 896 Compact Magneto Wall Telephone.

similar apparatus, so arranged that, if a line lamp is burning, no call from the distributing switches will enter this position. It is obvious that the instant a call originates from a line connected to the distributing switch, this switch will seek out that panel in a switchboard in which no calling lamp is lighted. Therefore, the calls automatically appear before the non-busy operators, and no call is permitted to enter any busy position.

It should be understood that, while distributing calls are barred from entering busy positions, calls from subscribers' lines permanently connected to a position are not barred. They in turn, only serve to bar distributed calls. This system has now been in operation at the York exchange for a considerable length of time and has proven in actual operating conditions all the claims made for it. It is a practical system, in equipment and operation, and easy to maintain. It may be applied to any existing manual exchange having common battery equipment, and can be installed at a minimum initial expense, with the result of maximum saving in operating expenses.

In the study of many different systems which may be adopted for inter-connecting telephone subscriber lines for city exchanges, we have in the Knoxville, Tenn., installation an idea, which is not only novel in its arrangements, but which has considerable merit from an operating point of view, effecting an absolutely even distribution of traffic and economy in operating expenses and maintenance, together with uniform service during the busy or non-busy periods. This system is known as the "manual call distributing system."

The arrangement of the equipment provides for all lines to terminate in lamp signals, which are mounted in a switchboard cabinet known as a call board. The so called "call operator" is stationed in front of this board, and observes the signals as the calls are originated. The entire duties of this "call operator" are to observe these signals, and to transmit them to connecting operators stationed at the regular switchboard. Means are provided so that the "call operator" can select only non-busy operators, and this process is uniform in its operation.

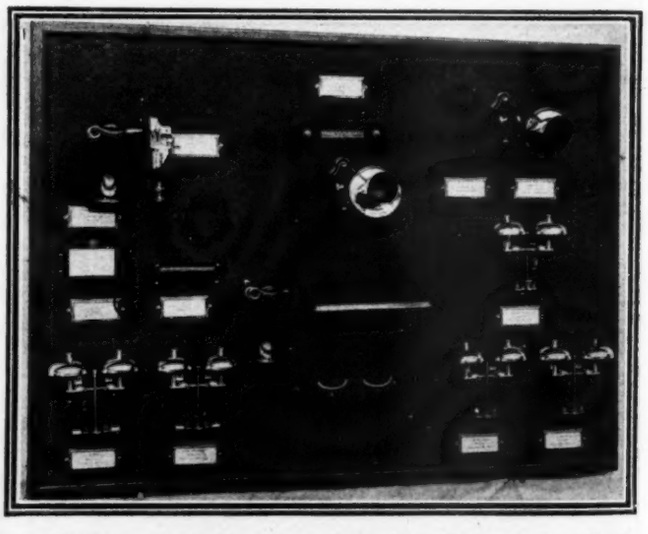
The connecting operators at the regular switchboard answer all calls and complete connections in the usual manner. In the design of the connecting equipment particular attention was given to having apparatus automatic in operation, featuring automatic listening in, automtic machine ringing, etc., all of which has a tendency to reduce the number of operations required by connecting operators in establishing connections between subscribers' lines.

Notable work has been done to improve the design and efficiency of the standard common battery lamp line multiple switchboards. We have installed numerous equipments of this kind during the year, such as Granville, N. Y.; Le Mars, Iowa; Grinnell, Iowa; Carlinville, Ill.; Thief River Falls, Minn.; etc. In each installation there are some characteristic features suited to the peculiar requirements of the locality in which they are installed. Furthermore, numerous changes in the design of the associated apparatus for these plants have been made for the purpose of improving the mechanical strength and life of the apparatus. and the efficiency of the equipments in operation with their associated parts.

For private branch exchange work we have made considerable progress in standardizing our equipment for this service and eliminating useless types, which gives us the opportunity to combine all the features of the various types into a few practical switchboards which experience has proven to be sufficient to meet all demands. Some original and unique features are characteristic of these equipments.

During the year 1912 we furnished more local battery switchboards than for several years, and believe there was a large growth for this type of exchange throughout all rural communities. The switchboard for these systems is a standard equipment consisting principally of the gravity self-restoring drop and a combination key in the cord circuit which combines the ringing and listening key, as well as the clearing out signal, which forms a part of the same key, and is displayed on the key shelf rather than in the face of the board, where it is customarily associated with the line drops.

We saw no need of any change in the general design in subscribers' instruments, but we did considerable work



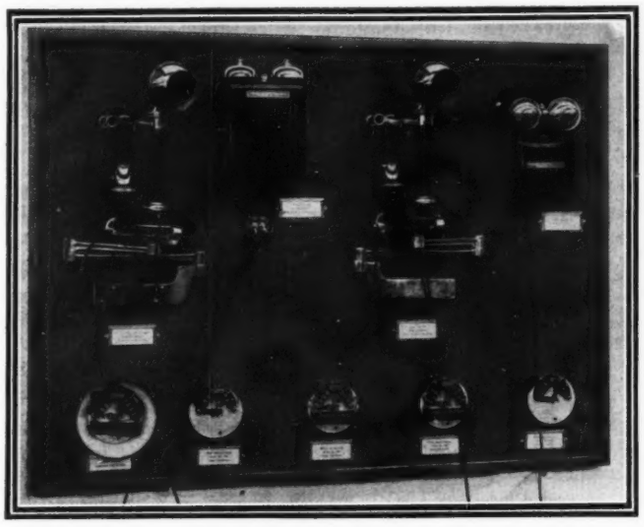
No. 951 Office Wall Telephone—Convertible Ringer and 4-Party Harmonic Reed Armatures.

with this class of apparatus along the lines of standardization and improvement of parts of the different telephones.

The compact magneto telephone may be considered a fixed standard, as far as its general design is concerned,

although noticeable changes have been made to improve the construction and efficiency of the receiver, generator, general assembly and other minor features too numerous to mention.

The demand for common battery telephones calls for a greater variety of types which are, principally, the desk telephone, the office wall telephone, the residence type tele-



No. 988 Desk Telephone, Showing Interchangeable Terminal and Contact Springs Mounting.

phon and the Combination-Phone. Our standards of these types have undergone some changes in the engineering department and include some individual features characteristic of this product only. The portable desk telephone, while the same in general appearance, has been entirely reconstructed in its interior so as to afford the interchangeable feature of making it possible to substitute numerous different arrangements of contact. By this means any desk telephone of the type can instantly and at very little expense be changed for service of an entirely different nature.

The convertible ringer is a typical feature of the office wall type telephone but it is furnished with other types also. This ringer is so constructed that by removing the armature and clapper rod, a harmonic armature and clapper rod can be inserted without making any other changes in the telephone, so that a straight line telephone, installed, can be easily and quickly converted to a harmonic party line telephone by this simple operation. The general improvements in other types of telephones have been along the lines of simplifying the design so as to improve the appearance and reduce the number of individual parts. A noticeable demand has been shown for the practical and most convenient of all types of telephones the Combination-Phone. The sale of this instrument has been more than five times as great as in previous years. With its redesign, which took place during the year, its future has been assured.

In making a general review of improvements and progress in telephone work during the year, it is quite important to mention the United States Army service buzzer, which this company manufactured under the supervision of the United States Signal Corps. This compact and highly efficient instrument is for composite telephone and telegraph field service, and has been a notable feature in our year's development work.

By close co-operation between the sales and engineering departments in this business we endeavor to meet the requirements of the trade, and at the same time offer additional features with standard equipments. This policy in our company covers a vast amount of different types of apparatus too numerous to even list, but we will mention the Mine-A-Phone, the Inter-Comm-Phone, and other private telephone systems which are classes of equipment that are of great importance by themselves.

The Independent telephone business for the coming year 1913 looks like a good prospect, and if the first 40 days already passed are any indication, we will find business as good this year as last year, and this is a conservative estimate of the possibilities for the future. Conditions and relations are becoming better understood and this will put confidence in both the buying and selling factions of the trade and, of course, improve conditions in general. The Independent exchange companies who are going ahead and are desirous of extending their lines and improving their service should proceed by making their service better known to their respective communities, through publicity work in addition to what they have been doing. In fact, the writer believes it would be practical for the Independent exchange companies to co-operate, first, by counties, then by states, and then nationally in a general publicity campaign for the purpose of making the interested public thoroughly conversant with what their purpose is, and what they have to offer in the way of telephone service. Good progress was made in 1912 and greater progress will be made during 1913.

Records Phenomenal Growth.

"The supply sales department of the Automatic Electric Co., of Chicago, has succeeded because of the company's ability to see the requirements of the operating companies and to immediately meet them, regardless of the outlay of money necessary," writes Elsworth Keith, its manager. "This progressiveness and the policy of equal service and courtesy to everyone, large or small, has evidently been pleasing to the Independent companies.

"This statement is verified by the business done in 1912, which showed an increase of 77 per cent. over 1911. Such an increase can only be built on satistory material. This company's strength in maintaining standards and developing improvements lies in the varied experience of its engineers.

"The design of telephone cords, for instance, which at first glance seems a simple thing, received the careful study of the whole organization. The result was a cord which pleased not only the manufacturing engineers, but the operating engineers.

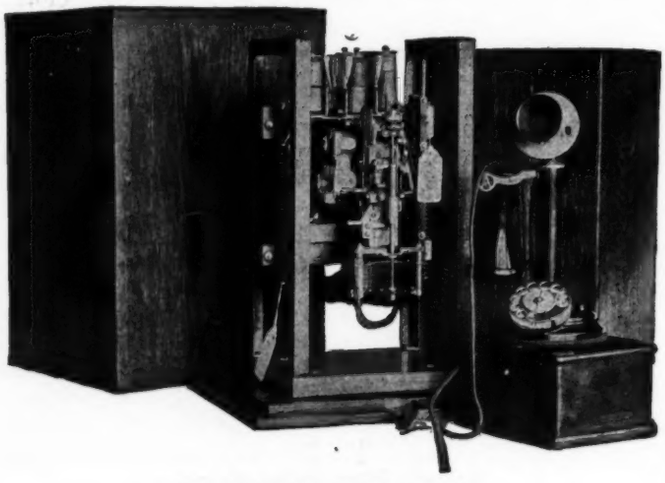
"The whole experience of this company's corps of engineers, which covers over 20 years of work, is concentrated, whenever necessary, on the one item in question. Consequently the problem is looked at from every possible angle and the solution is the most satisfactory for the company's customers. The cord department is four times the size it was one year ago—a tribute to the excellence of service and quality. A full stockroom must be maintained to insure shipments, so rapidly do orders come.

"The trade marking of the Automatic cords gave the company a big lead over competitors. The 'Raven Thread' cord has a black tracer in the outer braid. By this the cord may be identified after years of service. The company's guarantee is 'satisfaction' and by that it means that its goods will satisfy. If a cord wears out in three years and the buyer thinks it should last for another year, he may return it—after the three years of service—and receive the money he paid for it. This is the broadest guarantee ever made in any line of business, and it is interesting to note that the Automatic company is the only telephone manufacturing concern to put any such

guarantee on its goods. The company has the greatest faith in everything it makes and stands behind this faith with real money.

"There are now over 100 salesmen working directly or indirectly for the supply sales department. With the exception of the West, the whole country is well covered.

"The connection made with the Wesco Supply Co., of St. Louis, has given the best possible representation in the South and Southwest. The Wesco company maintains store rooms



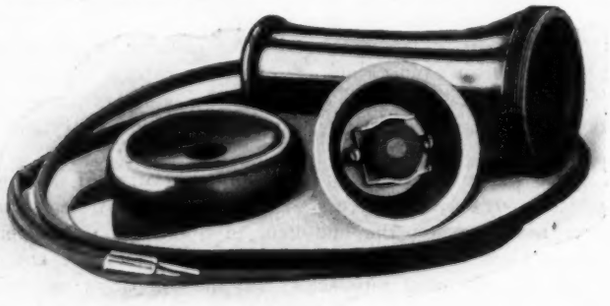
The Automatic Monitor System.

and sales offices in St. Louis, Fort Worth and Birmingham, and is able to ship Raven Brand supplies on a moment's notice.

"Seymour Hirsch carries a complete stock in Toledo, Ohio, and is able to give satisfactory service to Ohio, Michigan, Pennsylvania and eastern New York buyers. J. P. Rogers has charge of the New York branch and covers the eastern states.

"The company's idea is to give not only the best material at the lowest prices, but also to give shipping service which will enable the operating companies to maintain a smaller stock and yet not fall behind. It is reported that practically all the A and B companies in the United States are using Raven Brand supplies.

"The development and sale of automatic boards for private



The Pioneer Direct Current Receiver.

use has been started and this type of equipment is being welcomed throughout the field. The full automatic meets all conditions for private use and is by far the cheapest and most reliable system yet devised.

"The automatic train dispatching system has been perfected and will shortly be ready for operation on many of the railroads. The services of J. H. Finley, formerly the leading railroad salesman for the Western Electric Co., have been secured to direct the sale of this apparatus.

"The famous Pioneer direct current receiver has been given considerable attention and has been adopted in many exchanges as standard.

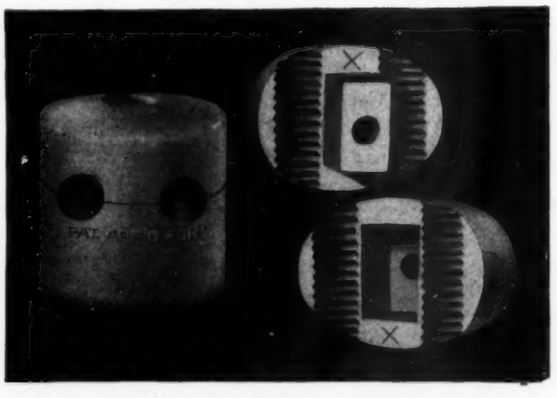
"Probably the most interesting production of the year was the automatic monitor system. This system has perhaps aroused more interest than any one thing yet offered to the Independent field. It is a system of secret supervision which can be operated in the manager's office or home. The sales have been large and not one serious complaint has been received. The company has pledged itself not to sell to a Bell company in towns where there are Independent exchanges. This gives the Independents a chance to perfect their service along a line where there can be little competition.

"Raven enamelled wire has been marketed successfully and at the present time machinery is being installed which will double the output. Many telephone manufacturing companies are using this wire for their magnets.

"Although this department's success is built upon honest methods, finest materials and personal service, its phenomenal strides would be impossible without the intelligent and enthusiastic assistance and support of TELEPHONY," says Mr. Keith in conclusion. "In considering our prosperity we continually bear in mind that TELEPHONY has made it possible for us."

A New Split Porcelain Insulator.

Something new in porcelain insulators has been brought out by the Colonial Sign & Insulator Co., of Akron, Ohio. This is known as the new Colonial Split Knob, the peculiar qualifications of which are very well shown in the illustrations with this article. It is urged, among other things, that this knob thoroughly insulates the nail or screw which holds it in place, an important feature. The recessed formation of one part, with the tongue on the other which fits snugly within it, hold the two parts of the knob securely, without turning, while the screw is being inserted. It can be used for twisted pair wire



A Novelty in Porcelain Insulators.

in telephone work and saves the use of one knob when employed in overhead tie work. The knob is self adjusting when placing the wire.

The new Colonial Split Knob is made at this time in one size only, although other sizes are now in process of construction. The present size is No. 5½, taking from No. 14 to No. 10 wire. Full details, with prices, will be sent upon application to the Colonial Sign & Insulator Co., Akron, Ohio.

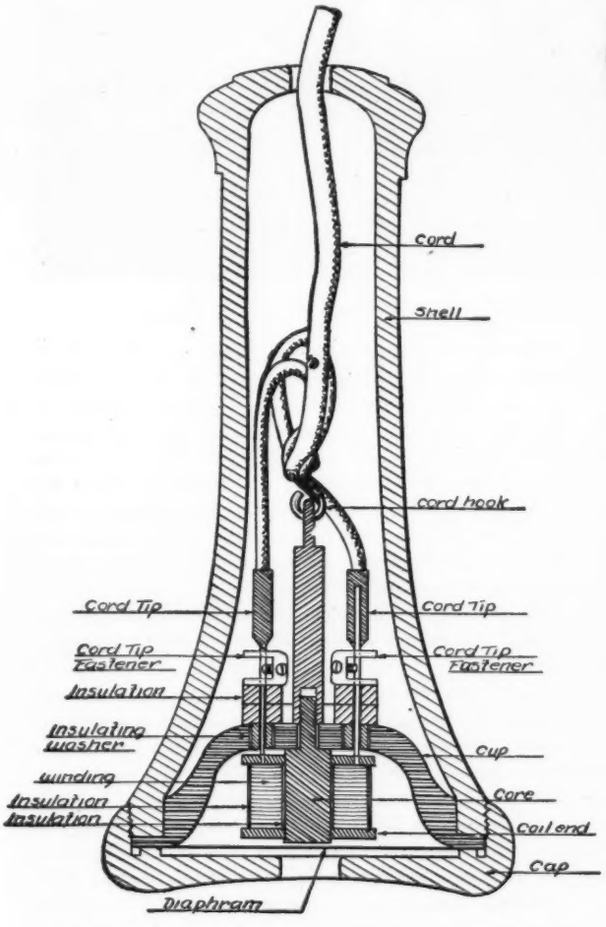
W. I. MIDDLETON, electrical engineer of the Simplex Wire & Cable Co., Boston, delivered a lecture recently at the Franklin Union, on the manufacture of insulated wires and cables. Illustrated by lantern slides, the lecture covered the entire field of cable manufacture from the first installations of a bare conductor in a trough of resinous material to the complicated designs developed to meet present day requirements.

THE CARBOLINEUM WOOD PRESERVING CO., of Milwaukee, Wis., advises TELEPHONY that it doubled its sales last year and that the outlook for 1913 is most promising in every way.

Century Company's Direct Current Receiver.

The Century Telephone Construction Company's direct current receiver, code No. 11 D. C., recently placed on the market, combines a number of excellent features in receiver construction.

The receiver cup is drawn up from soft iron of a considerable thickness and is afterward machined and thoroughly annealed. This soft iron cup forms one pole of the circuit and the soft annealed Norway iron core of the coil supplies the other pole. The cup also acts as a support for the diaphragm. The particular feature of this cup is that it makes a complete magnetic field entirely surrounding the coil. The large air space around the coil allows free and easy action of the diaphragm. The spacing between the diaphragm and the coil is permanent.



Sectional View of Century New 11 D. C. Receiver.

Receiver and Receiver Unit—Century's 11 D. C.

Another unique feature is the double connecting clips which hold the receiver cord tip firmly at two points, insuring perfect connections.

The receiver unit is designed to fit into the standard receiver shell used for the bipolar receiver. The receiver is sufficiently heavy to operate the ordinary hook switch, making positive contacts.

The Century company's new direct current receiver has been thoroughly tested out in actual practice and is said to have proven itself efficient in every respect.

The Century Telephone Construction Co. will be pleased to mail its Bulletin No. 11 D, which more fully describes this instrument, to anyone desiring it and, at the same time, will quote prices.

Iowa Farmers Resist Rate Raise.

A telephone uprising in the vicinity of Osceola, Iowa, among the farmers, follow the announcement by the Hawkeye Telephone Co., that there would be a material raise in rates for rural switching service, amounting to an increase of over 100 per cent. to the majority of the rural subscribers in that vicinity.

The fact that the former Independent company, prior to the sale to the Hawkeye, furnished a better class of service at the prevailing rates and paid regularly a semi-annual dividend of 4 per cent. is taken as ample evidence that the present contemplated increase in rates is exorbitant.

Announcement has been made in the columns of the local papers of a meeting to be held on Saturday, February 8, for the purpose of organizing an Independent company. The temporary committee is composed of C. T. Ayres, R. F. Collins, D. H. Gibson.

The Use of Standard Cable Equivalents.

In the article on the subject "The Use of Standard Cable Equivalents in Long Distance Practice" published in last week's issue an error was made in the formula for the length of line, the minus sign being left out before the parenthesis. The formula, page 24, should have read:

$$A=D-\frac{(C \times b)}{a-b}.$$

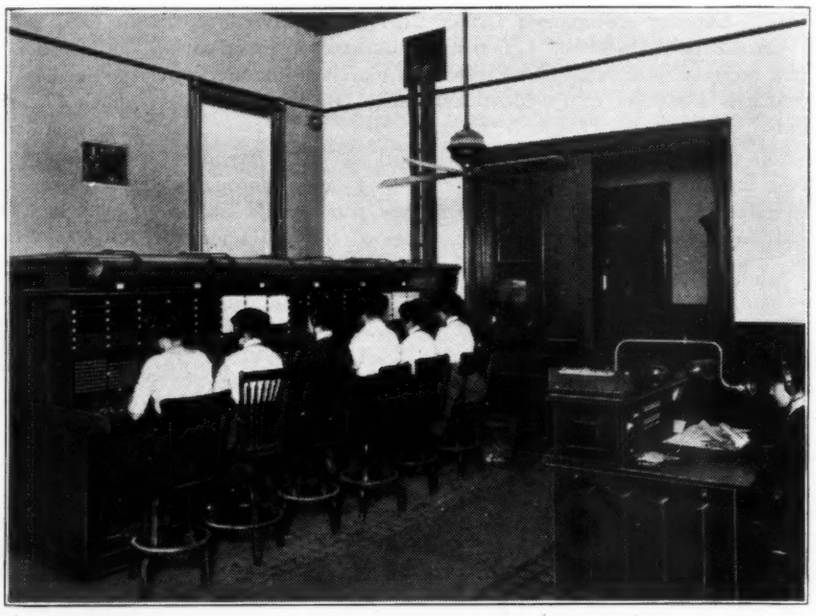
The omission was also made in the illustrative example. If the minus sign is inserted, the calculations will come out correctly.

Recent Advances in Manual Telephony.

By Charles S. Winston, Chief Engineer, Kellogg Switchboard & Supply Co.

For some time it has been the belief of many that manual telephony in general and the manual telephone switchboards in particular have been developed as completely as possible; that the saturation of efficiency has been reached; and that if more rapid and more economical service than now given is to be furnished, automatic switches must be brought into use.

Although it is not probable that any revolutionary changes will ever be made in existing manual practice, yet, during the past year, the Kellogg Switchboard & Supply Co. has installed in switchboards, which it has manufactured, a number of features which tend to lessen the work of the operator and hence to improve the service. These features are all associated with the operator's cord circuits, and no switchboard has been built which contained all of them. Cord circuits, in which all of these various schemes are employed, would be extremely complicated and in all probability would contain more relays than could be placed in the rear of an ordinary section. It is possible that these and other closely allied schemes will have a much more important bearing upon the future history of telephony than one, who has not given the subject much thought, would expect. In view of the future possibilities, a very brief description of the schemes which have already been put into practical use may be of interest. They are:



Kellogg 3,000-Line Common Battery Multiple Board in Operation.

1. Automatic ringing and manual ringing combined.
2. Automatic ringing and secret service.
3. Combination cord circuits, automatic ringing for common battery lines and manual ringing for magneto.
4. Combination cord circuits with secret listening.

Automatic ringing, as is well known, has been used for years quite generally by the Bell companies and to a considerable extent by the Independent companies, but the use of both manual and automatic in all cord circuits of a four-party switchboard is a recent development. In the switchboards which have been installed, in which this feature has been included, it is not the intention to use automatic ringing and manual ringing at the same time. It is not left to the operator to decide which one to use. The board is arranged so that at times of light load, during the night, or at any time desired, the machine which controls the automatic ringing can be cut out of service and the operators will proceed exactly as in manual ringing plants. The same keys are used for both manual and automatic ringing. When automatic ringing is used, the operator depresses the proper one of the four ringing buttons of the four-party key a single time only, while for manual ringing current is applied to the line only while the button is depressed. This arrangement reduces to some extent the power consumption and furnishes a flexible arrangement, as any trouble with the machine which controls the automatic ringing will cause only slight inconvenience.

The curiosity, which is an inborn characteristic of all telephone operators, is a matter with which all telephone managers have to contend to a greater or lesser extent. One of the points which the manufacturers of automatic apparatus emphasize particularly in their advertisements is that service with their equipment is "secret." This line of argument has carried some weight. One of the schemes which the Kellogg company has employed in some of its recent boards makes it possible for secret service, or service which is as nearly secret as possible, to be furnished. This secret service scheme is easily furnished in switchboards using automatic ringing, as most of the additional apparatus required for one of these schemes can also be employed for the other.

Operating Room of Flourishing Common Battery Exchange Completely Equipped With Kellogg Apparatus.

Two different schemes have been used for preventing the operators from listening after conversation has begun. In one, the operator's set is automatically connected to the cord circuit when the answering plug is inserted into the answering jack of the calling line, and disconnected when the corresponding calling plug is inserted into a multiple jack. Hence, it will be seen that an operator cannot, in the ordinary course of her work,

listen to a conversation. If either subscriber flashes his supervisory lamp to attract the operator while the connection is established, she can insert a second answering plug into the multiple jack of the calling line and converse with either or both subscribers. Her ability to listen in this manner defeats to some extent the secret listening feature, but an infraction of the rule against listening, except when occasion demands, can be easily detected. In any event, a considerable amount of exertion is necessary before the operator can listen to a conversation, and operators, like most people, are opposed to doing unnecessary work. If a listening key is available, the work of the operator, which it must be admitted is more or less monotonous, is relieved during her idle moments by the gossip which is constantly being transmitted over telephone lines.

In the second scheme, the listening key is retained. The operator's set is connected across the cord circuit when the listening key is thrown and either subscriber has his telephone upon its hook. During conversation, the operator cannot connect her talking circuit to the cord circuit used in the connection.

In most common battery switchboards, there are certain lines which, either because of their length or the number of instruments connected to them, are magneto and terminate in drops. The operator at the position at which these lines terminate must have cord circuits that will enable her to establish connections between these lines, or, between them and the common battery lines that terminate at other positions. In order to make it unnecessary to change cords, it is necessary to have cord circuits that can be used for making all connections. It is, however, impossible to provide automatic ringing for magneto lines. As a result, a separate ringing key must be furnished for ringing the magneto lines or else some means provided which will make it possible to use the same keys for both common battery and magneto. The latter arrangement is especially desirable when the magneto lines are equipped with instruments having party line bells similar to those in the common battery instruments. As a result, cord circuits have been furnished which automatically change from manual to automatic ringing when occasion requires.

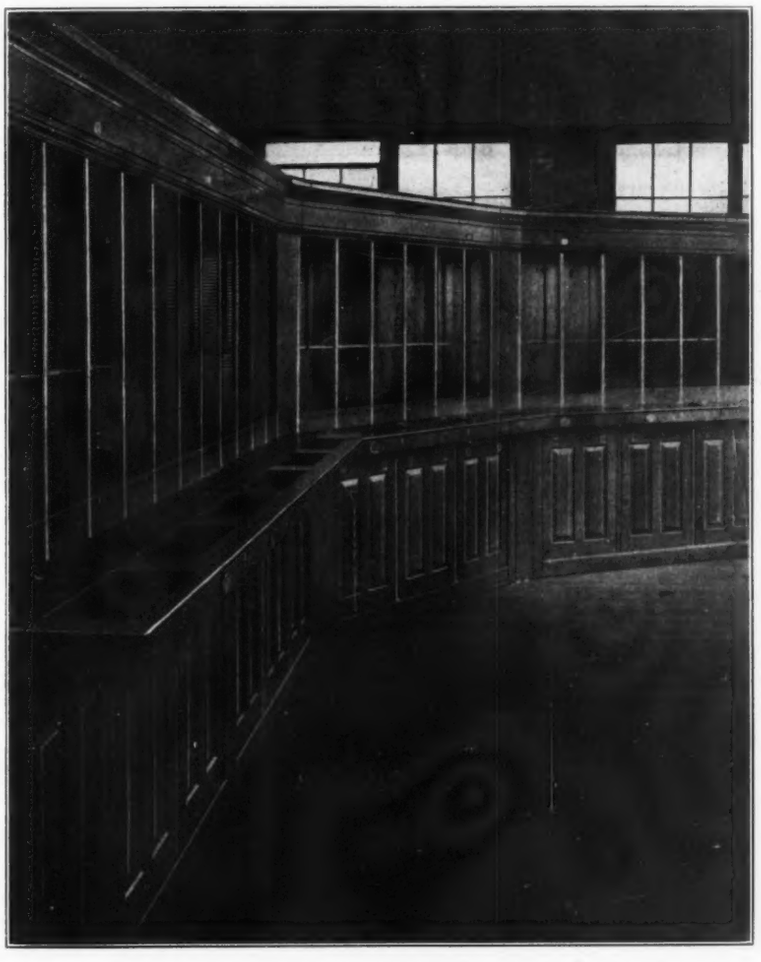
Combination cord circuits with secret listening are arranged so that when two common battery lines are connected the operator cannot listen to the conversation. When a connection has been established between a common battery and a magneto line, she can connect her telephone set across the cord circuit by throwing the listening key.

During 1912, there was an increasing demand for the Kellogg Universal switchboards. The first board of this type was installed by H. P. Schmidt, the well known Kellogg engineer and installer, at Sao Paulo, Brazil, in the summer and fall of 1911, and the rapid sale of these boards since that time shows conclusively that a real need has been met. The general scheme is to make it possible for common battery and magneto lines to be operated simultaneously on the same board. All lines can be magneto at first and then changed gradually, a telephone at a time if desired, to common battery. This makes it unnecessary to change an entire system from magneto to common battery as the switchboard can be purchased and the magneto instruments used as long as desired.

In cities where telephone rates have been fixed by franchise, the telephone companies can often increase their rates gradually by offering magneto service at the specified rate and the superior common battery service at a higher rate. When all lines have been changed to common battery, the apparatus in the cord circuits, which was made necessary by the magneto lines, can be taken out and all circuits will then be standard common battery circuits. When changing a line from magneto to common battery, no additional apparatus is required.

American Electric Working Overtime.

The American Electric Co., Chicago, has been very conservative in its statements as to business conditions in line with its conservative and sound business policy. A visit to the factory, however, it is declared, would quickly convince anyone that its statements are not overdrawn at all as to the necessity of running over time during nine months of the last year and continuously up to date. Considerable extensions to the plant are now in contemplation to care for the rapidly increasing business, which is attributed by the company, not only to the quality of the equipment consistently maintained, but to the correctness of its established business policy of giving a little more than full value in every one of its business transactions.



Big Kellogg Multiple Common Battery Board in Process of Assembling.

While the company does bring out from time to time new apparatus, its manufacturing policy during the last year has been to work out refinements in standard apparatus, improving here and there in the product, already exceedingly well known and so extensively used. The company says it has broadened its trade relations and established a number of splendid selling agencies with stocks for quicker delivery of its product to users. Splendid progress during the last year is recorded in the opening of export fields.

The company asserts that it is offering to the telephone companies anywhere an absolutely high grade product covering every need in both magneto or common battery equipment, from an absolutely Independent factory source. Three of the most popular equipments which this company manufactures are

the Burns Express switchboards, for magneto work in from 20 to 1,200 lines capacity; the No. 360 magneto wall telephone, and the No. 43 magneto desk telephone.

The Burns Express switchboard has been manufactured for several years, hundreds being in use today, and, it is declared, without a single one known to have been taken out or replaced. It is said to be built along simple lines, which make the Burns Express board absolutely reliable in every respect. The No. 45 Burns Express drop and jack has received the most favorable comments from telephone engineers, and has made universal friends, the company says.

Magneto Wall Telephone, Open.

"Both the drop and jack," the company claims, "are remarkably free from small or delicate parts, and further, the total number of parts required are about half what is generally found necessary in other drops and jacks now on the market. The jack includes but two springs and these are of very substantial construction, exceptionally well insulated, and rigidly mounted directly on the drop and jack frame. The No. 45 drop and jack is assembled in single units, and can therefore be installed in, or removed from, the switchboard more readily than if assembled in strips. Furthermore, as all necessary wiring and cabling is completed at the time the switchboard is put into operation, no labor is required when additional drops are installed beyond inserting the drops in the cabinet, and neither tools nor experience are necessary for this work.

"The No. 360 telephone is practically three years ahead of any other instrument on the market today. It is absolutely unique and has proven a winner wherever sold. It will fully meet with all requirements and can be furnished with any combination for use on any magneto system. It is equipped with an entirely new type of arrester, having cylindrical carbons with a surface of five square inches, also equipped with the latest improved type local and long distance transmitter and receiver, and an efficient generator. The generator, hook, switch, and induction coil are all mounted on one shelf, which is easily removed so that all of the working parts are readily accessible. The induction coil can be removed without the use of a soldering iron, as it is held in place by the use of Fahnstock clips. The hook switch also has a removable lever.

"The No. 43 desk telephone has stood the test of time, owing to its solid construction and simplicity. The solid head prevents loose connections and broken cords. One large screw holds the base and stem together; there are no wires between the base and stem. Instead, a rod contact is used from the switch to terminal springs. A strong spiral compression spring supports the switch hook. The roller cam also assumes positive contacts. The induction coil is mounted in the base. The No. 43 desk telephone saves maintenance in four ways. It has one less conductor in the cordage; a lower center of gravity, which prevents toppling of stand; it is easily tested and repaired; the induction coil is safely hidden, preventing meddling and damage.

"All standard parts are used in our telephones and the American Beauty transmitters operate in many high voltage plants for less than 10 per cent. maintenance—in magneto exchanges for less. Every other part used is of the same high quality. A trial order is convincing."

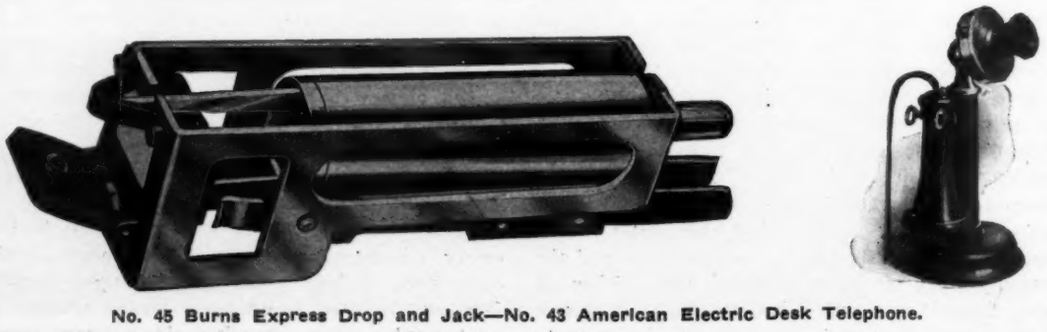
The American Electric Co. report its sales on common battery equipment to be well maintained in the face of competition, and attractive prices are quoted on this line of goods with quick deliveries. From time to time the publicity department sends out new literature, and it is to the advantage of every telephone company to see that it is on the mailing list.

Fire Pots and Torches.

As pioneers in the fire pot and torch business the Clayton & Lambert Mfg. Co., of Detroit, Mich., is well and favorably known. From a small beginning, by careful attention to the business; by supplying stock made from the best materials; by expert skill, the company has, it states, built up a large list of satisfied users.

Two of the Clayton & Lambert Products.

Almost every mechanic is familiar with the C. & L. torches and fire pots. The makers market their stock under a guarantee which covers a period of 6 months from date of pur-



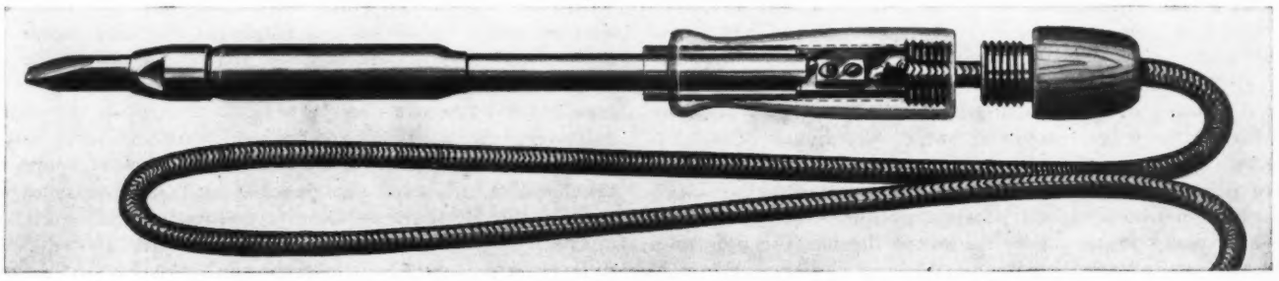
No. 45 Burns Express Drop and Jack—No. 43 American Electric Desk Telephone.

chase. Today the line embraces a large number of high grade kerosene and gasolene fire pots and torches.

It has been the company's ambition to make and supply the trade with stock that will, in the hands of the user, give the best satisfaction, and it is claimed that it has never experimented at the expense of the user. The company advertises that "all leading jobbers will supply at factory price," and calls attention to the fact that back of each C & L fire pot and torch there is the maker's guarantee and reputation for honest goods covering a period of nearly a quarter of a century.

The New Cook Soldering Iron.

Mechanically correct, electrically perfect, is the way Frank B. Cook describes the new No. 2 electric soldering iron. It is said to consume but two-thirds the current of other standard makes, and sells for about one-half the price, besides being backed by the broad guarantee of a manufacturer of known responsibility. It is made in any size—any degree of heat—for any purpose for which a soldering iron or similar portable heating device is required.



Frank B. Cook's New No. 2 Electric Soldering Iron—Phantom View Showing Construction.

"We have invented and now offer to the trade an electric soldering iron," is the company's introductory statement, "that is as near perfection in both mechanical and electrical detail as is possible to produce—an iron superior to any yet devised and one we guarantee in the broadest sense to give you service and satisfaction, and, in the matter of first and second cost, the most economical on the market.

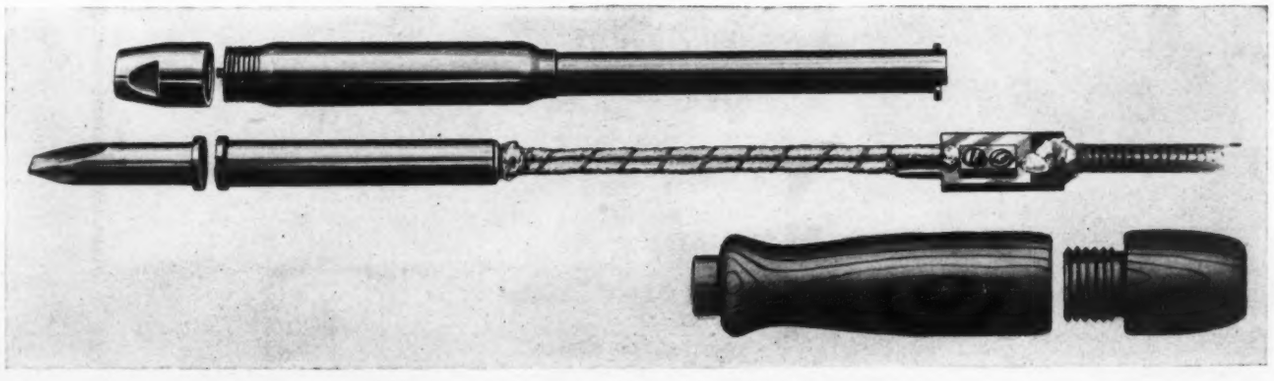
"The assembly of the iron is simplicity itself. All parts are readily detached and interchangeable. Every precaution has been taken against trouble due to either moisture or heat variation. The great danger present in all heating devices is due to the expansion and contraction of the heat generating parts and those directly associated with them. These have been carried past all danger points, and are held to place with just the proper degree of space for the necessary change of position and are surrounded by materials that give the most exacting results for the hardest conditions they are expected to meet with. Rated by the wattage per pound, they take less current by from 10 per cent. to 30 per cent., than any of the well known makes—a saving that will in a short time more than pay first cost.

"The distribution of heat in this iron is really wonderful. It would naturally be supposed this would be greatest at the center of the heat-unit. In reality the heat is lowest at the end of the element, increases slightly at the center of it, then to the center of the soldering point, and the extreme end of the soldering copper, where the greatest heat is desired, is absolutely the hottest point to be found on the iron."

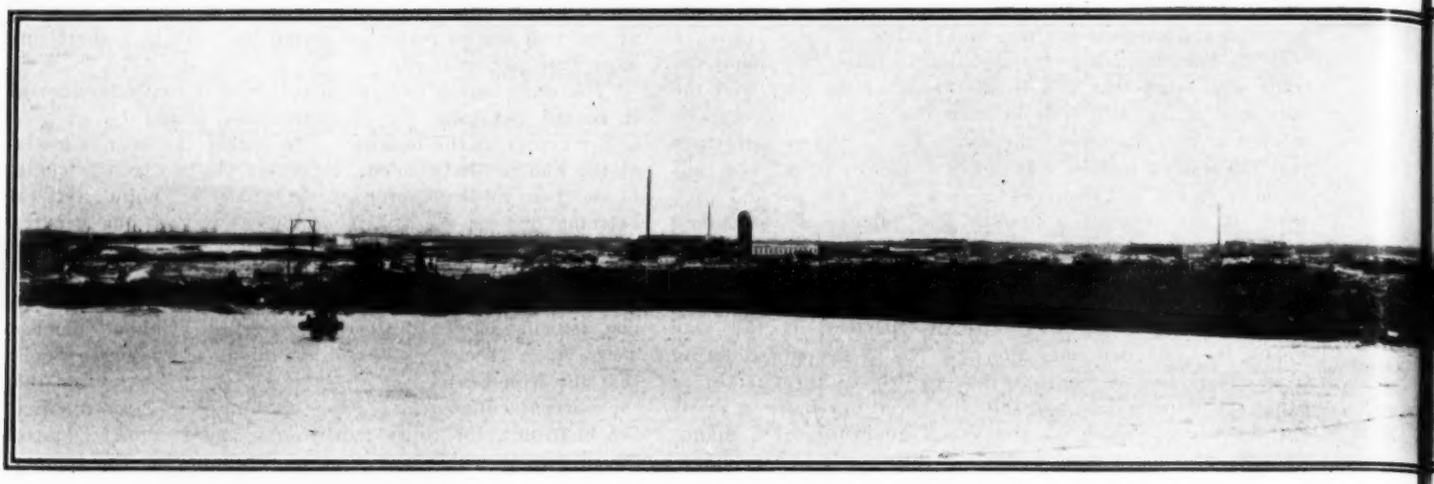
A further feature of the iron, the company declares, is that it will stand considerable overload without damage. Tests have shown on a voltage increase of 10 per cent. that the iron heated but slightly over its average, and that the current consumption was not enough greater to affect the heat-unit, for the reason that a ballast effect is introduced into it which increases in resistance as the temperature rises above the danger point and maintains the flow of current within a reasonable range. This ballast effect also permits the iron to give very good results when operating on a voltage of 10 per cent. less than rating. When used on an alternating current this feature is claimed to be especially desirable.

The design of the iron is mechanically correct, the company states. It fits the hand and balances perfectly. The handle is of hard wood, turned to a mathematical nicety. The frame is swedged and formed from one piece of seamless steel tubing. The heat units or elements are supplied for any wattage or heat desired and, being readily changed, do away with the necessity of purchasing a complete iron for currents of different voltage. The copper tip can be furnished in any special type or style desired.

The company claims the strongest possible construction—all parts interchangeable and accessible—an iron that will work with safety on a variation in voltage of 10 per cent. either way from rating—the most economical in first and second cost—scientifically correct in design. It is equipped with 6 ft. cord and attachment plug.



Detail of the New No. 2 Cook Electric Soldering Iron.



The Four Views on These Two Pages Show the Wide Sweep of the Crawford Company's Water-Front.

Interesting Information from Crawford Cedar Co.

On this and the opposite page are shown panoramic views of the yards of the Crawford Cedar Co., at Menominee, Mich. These appear to afford convincing evidence of the ability of the company to care for, not only ordinary demands upon its resources, but extraordinary ones.

At the extreme right of the upper pictures are shown the post docks, of which there are six, with slips intervening, on which approximately a million posts are stacked —7 ft. and 8 ft. long. Following to the left the pole piles appear, only a small portion of them showing, the yard at this point running probably 1,000 ft. west.

The company has trackage of over 2,000 ft., some of which runs through the yard from south to north, while in the pole yard there are three tracks between the different piles of materials. At this time there are carried in stock over 500,000 poles, from 16 ft. up, all of which are moving fast, largely on account of the demands made by the Independent telephone companies which the Crawford Cedar Co. supplies.

In the foreground, in the ice, there are seen several thousand poles which the company was unable to pull out of the water before the winter freeze set in. As is well known, the company handles its poles with a travelling steam derrick, which may be seen in the picture. But, this last summer, the steam derrick was unable to take care of the big shipments which were made, and its work was supplemented by three gin riggings, operated by horse power, and loading in as many different locations in the yard. The company's facilities for loading enable it to handle from 12 to 15 cars per day.

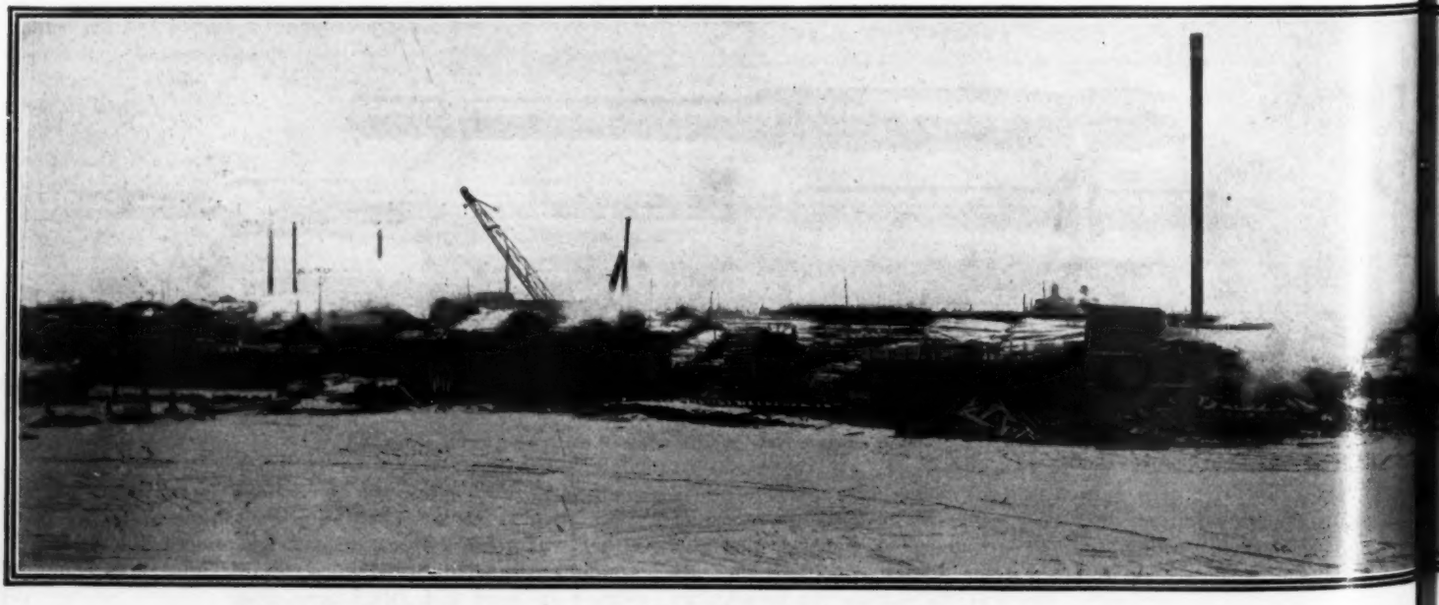
Besides the posts and poles which the pictures show, there is a large tie yard, as well as a big clear space for the handling of cedar shingles and lath, which do not appear in the photographs here reproduced.

The company's location, at Menominee, gives it five different roads over which it can ship, the Ann Arbor and Pere Marquette car ferries, the Northwestern, the St. Paul and the Michigan. This range enables the company to secure cars promptly in spite of car shortage at many other points, particularly those at which there is no competition for freight business.

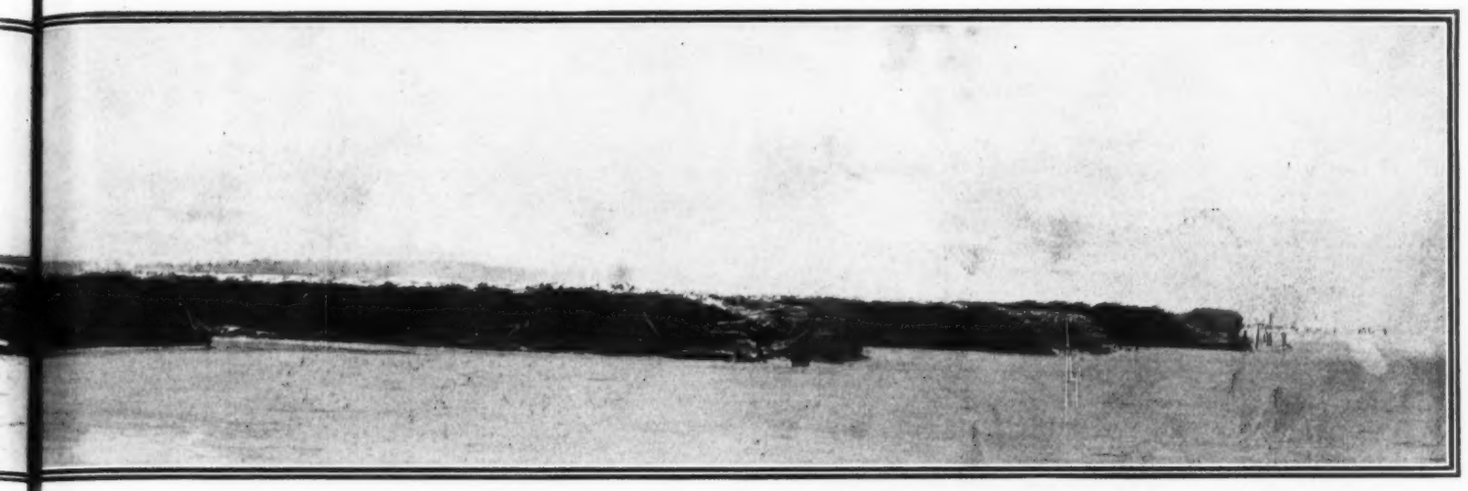
The Crawford Cedar Co. has been supplying the Independent telephone field with cedar poles for many years and prides itself upon its reputation for fine stock, quick delivery and reasonable price. All inquiries are answered immediately and managers contemplating spring pole line construction would do well to get in touch with this firm.

Andrae Company Takes Optimistic View.

"Our 1912 telephone business has been very satisfactory as determined by volume," said J. C. Schmidtbauer recently.



The Steam Derrick's Work is Now Supplemented by Three Gin Riggings.



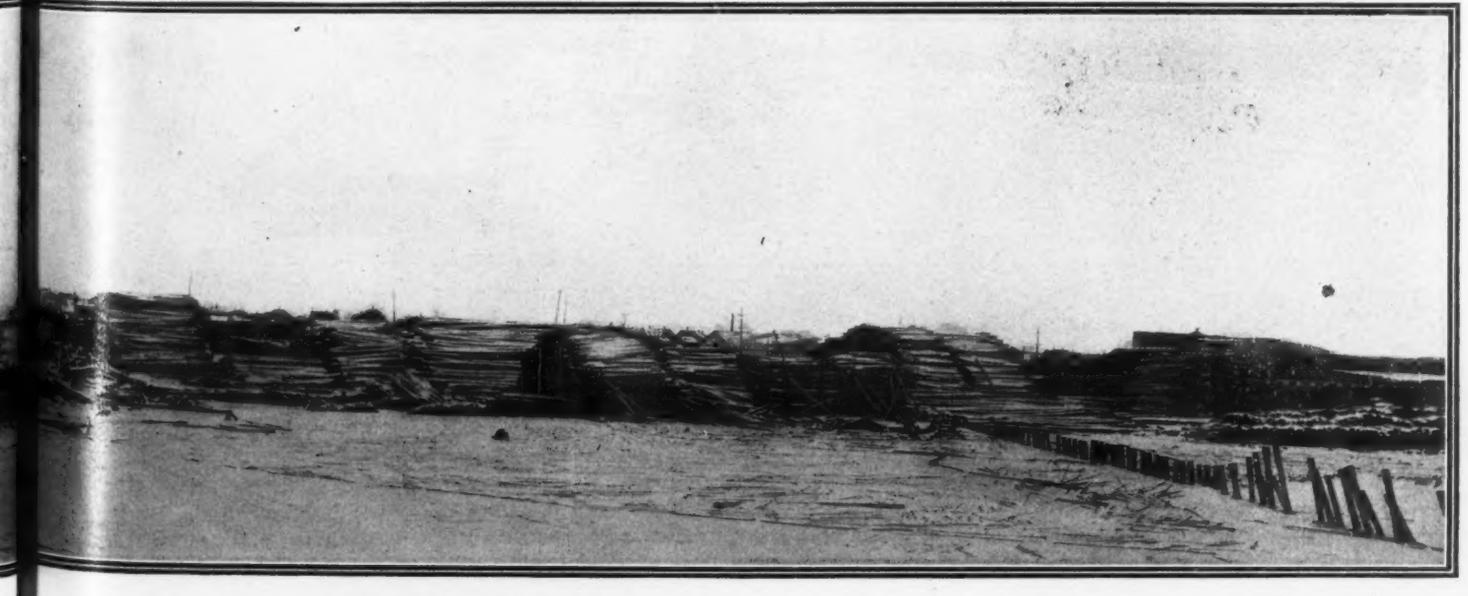
The Post Docks, Numbering Six, Contain Thousands of Cedar Posts.

Mr. Schmidtbauer is vice-president of the Julius Andrae & Sons Co., of Milwaukee, Wis. "From the standpoint of profit," he continued, "the past season has not been very satisfactory. Telephone manufacturers are to-day selling their product at prices that are lower than have ever before been quoted, notwithstanding the fact that practically all of the raw material, as well as labor, shows a decided advance in cost. We are going to advance our prices, as we find it absolutely necessary to do so, in order to realize a reasonable profit on the sale of telephone apparatus. Notwithstanding the fact that the Bell interests are consolidating with Independent companies here and there, we find that Independent manufacturers who are producing high grade apparatus are obtaining a large volume of business.

"With 22 years of experience in the Independent telephone business behind us, we find it unnecessary to make the frequent changes, some for better and some for worse, that are characteristic of some of the newer manufacturing companies. No opportunity, however, is overlooked to improve our apparatus, and we would ask our patrons to carefully note that we say 'improve,' as we do not believe in making changes, without improvements. It has always been contrary to our policy to adopt every new fad or freakish design. Our policy is to produce a telephone with all parts better than they actually need be."

"This idea is particularly applicable to our generators. Andrae generators are equipped with magnets of extra quality imported Tungsten steel. Every lot of new steel is analyzed and tested before it is put through the factory. Andrae generators have long been noted for their large output and for their permanency of service.

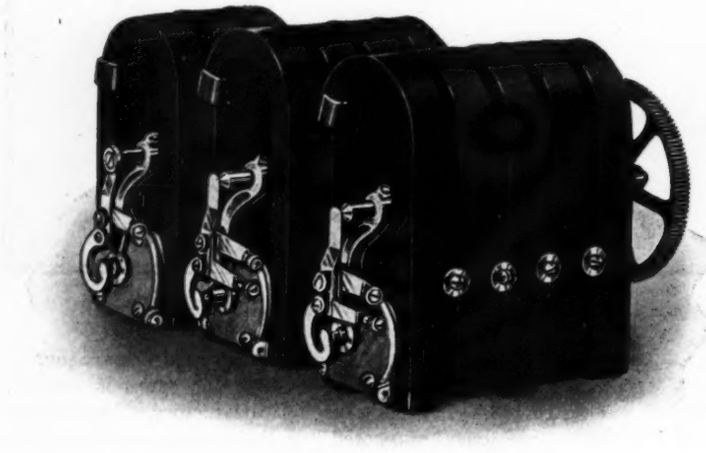
"Andrae ringers offer the public some decided improvements. The method of adjustment is simple, effective and permanent. The Andrae switch hook is provided with springs that will not weaken, and that cannot accidentally be bent or jammed when being replaced or removed. Hook switch contact points are of platinum, preventing corrosion and unsatisfactory operation. Andrae long distance transmitters are being used by some of the most exacting telephone buyers in the country, and, while we have made few changes in the design of this part of our telephone, as a matter of fact, no changes have been necessary for a good many years. Particular attention is called to the solid milled bridge used in our transmitter. The majority of manufacturers are content to use a cast or stamped bridge, which are lower in cost than the milled bridge, but are more susceptible to vibration, and have a tendency to vary in talking qualities with the weather. All Andrae transmitters have a permanent electrode connection extending through the insulating block. In connecting or disconnecting the transmitters, no delicate operations are necessary. One wire entering the transmitter is connected to a substantial binding post on the insulating block, which in turn is connected to the



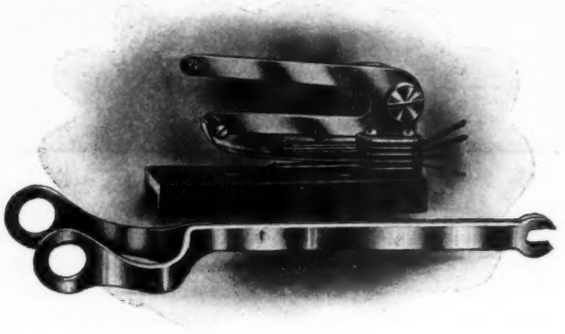
Where Many of the Cedar Telephone Poles Are Shipped From to All Parts of the Country.

ribbon conductor. The second wire is connected direct to the bridge, eliminating any possible chance of loose connections through joint of arm. The heaviest pliers or screw driver may be used in making the connection, without in the least damaging the transmitter.

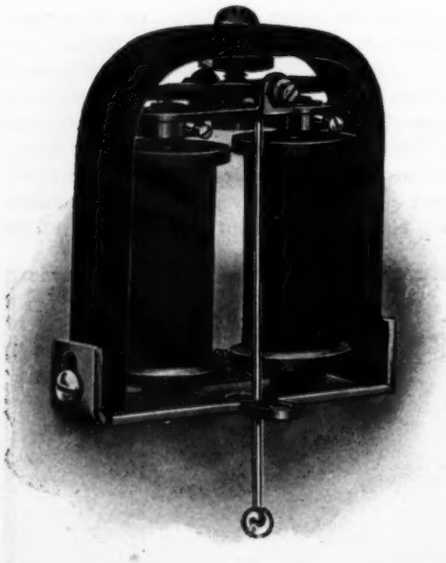
"Imported French granular carbon of an exceedingly hard quality, absolutely free from dust, is used in Andrae transmitters. The Andrae receiver, which is of the well known loose shell type, is extremely simple, sensitive, but withal possesses great clearness and volume. These receivers are constructed to permit a permanent adjustment at the factory, and, being properly adjusted, invariably remain in adjustment. The shell does not hold any of the parts in their operative positions, but is merely used as a retaining receptacle and handle. Coils are removable and interchangeable. Induction coils, transmitter arms, cabinets, in fact, every detail entering into the construction of our telephone receives the most careful attention, and no point, no matter how unimportant, is overlooked.



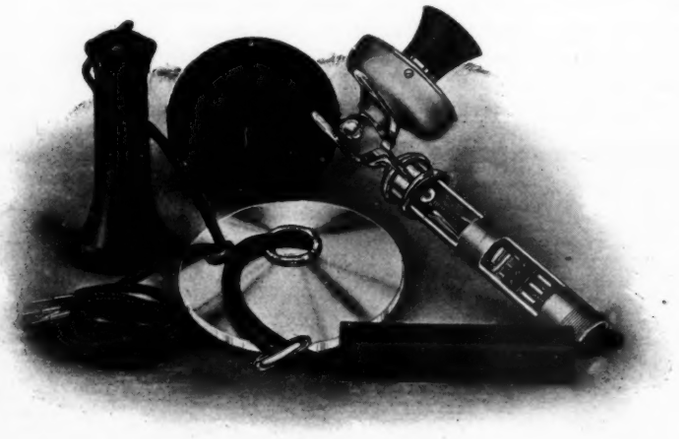
Generator Has Magnets of Imported Tungsten Steel.



The Andrae Hook Switch.



"A Ringer Offering Decided Improvements."



The Andrae Portable Desk Telephone Disassembled.

"In addition to our standard series and bridging magneto wall telephones, which are furnished in a large variety of cabinets, we are building an ideal desk set. The Andrae portable desk telephone is one of the new designs of apparatus we are placing on the market. Every detail has been given careful consideration, all trouble points eliminated, resulting in an instrument combining durability with high efficiency. The pedestal or handle is made up with a rubber covering, which is securely fastened by means of a check nut on the interior tube, and will not have the unsightly appearance due to wear or tarnish of nickel-plated stands, caused by handling. The base is of large diameter, preventing the stand being easily overturned. The switch hook and terminals are self-contained and are accessible by removing one screw. The adjustment of the springs is so arranged that when the restoring spring operates the switch hook, the roller is free from contact with the springs, thus avoiding short circuits and other annoyances caused by traces of metal which may collect on the roller. All springs are of German silver, with pure platinum contacts.

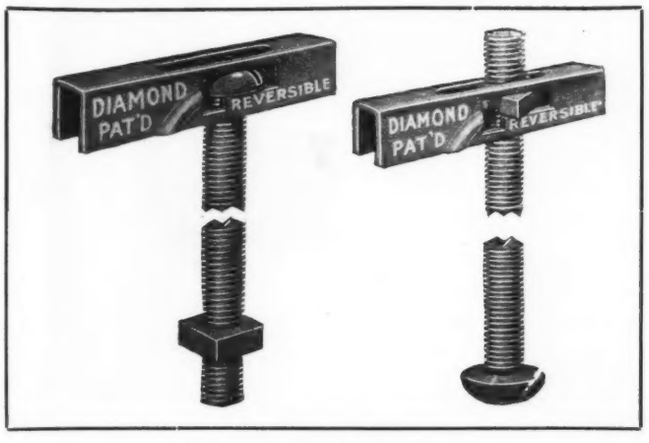
"Andrae desk sets are regularly furnished with generator, ringer and induction coil mounted in one cabinet. All terminals are located in the interior of box, and are properly marked to avoid any possibility of incorrectly connecting desk stand to generator. These desk sets are also furnished with generator, induction coil and extension bell mounted separately. The cords connecting the stand with magneto have colored threads running through them to facilitate proper connecting and tracing of circuit. Ring-through non-interfering central checking, divided circuit, central energy, iron box, street railway and mine telephones are also a part of our regular output. Magneto express type switchboards, in all sizes of cabinets, ranging from 50 capacity to any number desired, together with ringer switchboards for rural lines, and a complete line of telephone parts and supplies, completes our line.

"We anticipate a larger volume of business for 1913 than ever experienced before," said Mr. Schmidtbauer in conclusion, "as we have a more complete, and, we believe, a better line of apparatus. We are just completing the distribution of a new 300-page catalogue."

The New Diamond Reversible Toggle Head.

A new toggle bolt is bound to be of interest to telephone men. The Diamond Expansion Bolt Co., of New York City, which has made its expansion bolts well known wherever such appliances are used, has just brought out a reversible toggle head, which is particularly designed for making quick and permanent fastenings in hollow tile, hollow cement blocks and walls constructed of expanded metal or wood lath. It is pointed out by the company that the general use of toggles when working in material of this nature is found necessary where the thickness of the outer shell of the wall is not sufficient to sustain an expansion bolt.

The new Diamond reversible toggle head is made in two



New Diamond Toggle Head.

types, one in which a finished head is exposed and one in which the threaded rod projects with a nut, plain or ornamental, to tighten up the work. It is said to accomplish work which has hitherto required two distinct styles. That is, it may be used with either the head or the nut of a stove bolt at the outer end. This is clearly shown in the illustrations here printed. Among the arguments advanced by the manufacturers in favor of the new device are great holding capacity, simplicity, convenience, the absence of small rivets (which, it is said, often bind or rust), and the small hole necessary for its employment.

The Diamond Expansion Bolt Co. will be glad to send samples of the new toggle head to interested telephone managers, and to quote prices in quantity.

Past Year Good for Cleveland Company.

The National Telephone Supply Co., of Cleveland, Ohio, reports to TELEPHONY that the business of the year just closed was more than 30 per cent. greater than its previous best year, and that the outlook for 1913 is even more rosy. The company is increasing its facilities considerably and is adding a hot galvanizing plant to its factory equipment. This, it is expected, will be in operation within a short time. "If business conditions remain good," says F. P. Auxer, president of the company, "there is no question but what this will be our banner year."

Perhaps you think the telephone is a modern invention, says a Chicago paragrapher. Consult Richard III., Act. V.: "Come, bustle, bustle. Call up Lord Stanley: bid him bring his power."

Western Telephone Reorganizes.

The Western Telephone Mfg. Co., of Chicago, has just completed a reorganization and has removed to larger quarters, where the firm will be in much better position to take care of its customers. A quick service department has been added to the plant and the company is now in position to ship all orders the day they are received.

The new members of the firm, who are all young men and "hustlers," are as follows: President, John J. Hoellen; vice-president, M. J. Schmit; secretary and treasurer, L. S. Kaufholdt.

Signs that "Are" Signs.

The Meyercord Co., Inc., Chicago, has specialized for some time on signs for telephone companies—not ordinary signs, but signs which are different. As is well known, one of the Meyercord Company's feature productions for many years has been decalcomania transfers, for window use. This form of advertisement has been worked up in several forms for telephone companies. They are adaptable for window signs in offices, or on telephone booths, or behind flashing or steady electric lights. These, as made for Independent telephone companies, carry the shield in colors, with the words "Independent Telephone. Local and Long Distance." They are made in two sizes, Nos. 25 and 26, No. 25 is 8 in. by 10 in. No. 26 has the shield mounted on a white circular background, the diameter of which is 15 in. The measurement of the shield itself is 11¼ in. by 13 in. Pure oil colors are employed. To apply the transfer it is simply necessary to dip it in water, smooth it against the glass and, later, remove the paper background.

Window Transfer Sign.

The company's Vitrolite signs are beautiful productions, designed to attract and hold the eye of the passer-by. Vitrolite is an exclusive product of the Meyercord Co. In color it is milk white and it has the appearance of fine china, with a heavy glaze. Its wearing qualities are said to be equal to those of glass, as it is not affected by the weather. The Vitrolite signs are put up in a variety of forms, one of which, the hanging sign, is here shown. The actual measurement of this style is 2 ft. in width. It projects 3 ft. from the wall. It is two-sided and is illuminated from the inside. The "Drum" sign is built to attach to the corners of a building. It also carries illumination from within. A third form is the hanging chandelier, for indoor use. It, too, is two-sided, the ends being set with jewels.

Meyercord's Hanging Vitrolite Sign.

The Meyercord Co. will be glad to answer all inquiries re-

garding any of these signs, and to quote prices for single articles, or for a quantity.

An Electric Telephone Booth Ventilator.

A mechanical ventilating device, endorsed by telephone engineers and proving a great practical value in installations already made is the Sturtevant Electric Telephone Booth Ventilator. This ventilator, it is claimed, actually changes the air of the booth while it is in use, supplying fresh and forcing out stale air.

The ventilating arrangement, which is patented, comprises a small electric ventilating blower which forces air into the booth through the top, as shown in Fig. 1. A special diffuser,

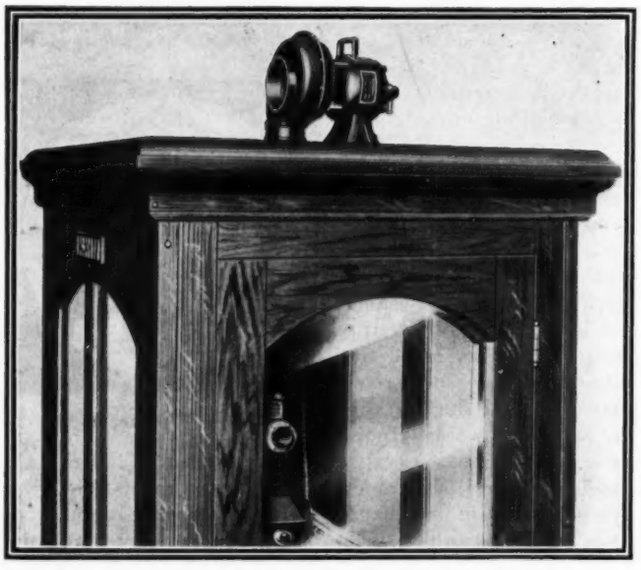


Fig. 1. The Sturdevant Electric Booth Ventilator.

shown in Fig. 2, prevents the air from striking directly on the head of the occupant of the booth.

Adjustable brass slide gates, shown in both illustrations, provide a means of exit for the air which, leaving the inner shell of the booth at the bottom, passes upward through the dead air space between the inner and the outer shells and finally leaves through the top. This method of introducing and removing the air changes its direction and velocity so

Fig. 2. Detail View Sturdevant Ventilator.

many times that sound waves are completely broken up, making the conversation within the booth inaudible.

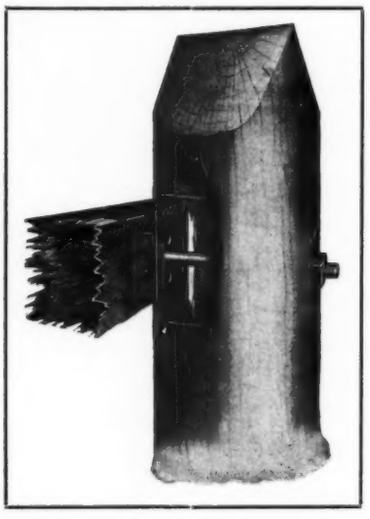
The quiet operating fan, well insulated by thick pads of felt, does not distract the attention of the occupant. When the fan is not in operation, the diffuser and slides may be closed, making the booth soundproof under these conditions.

An arrangement for ventilating several booths by means of one fan was described in TELEPHONY December 7, 1912. Fibre tubing is used to convey the air from the blower to the booths, and, in case of shut-down, communication between the booths through this pipe is prevented by closing the diffuser in the top of the booth.

These telephone booth ventilators are built by the B. F. Sturtevant Co., of Hyde Park, Boston, Mass., for either single or multiple booth arrangements and are said to be finding much favor in public booths in hotels, clubs and railroad stations where the service is continuous.

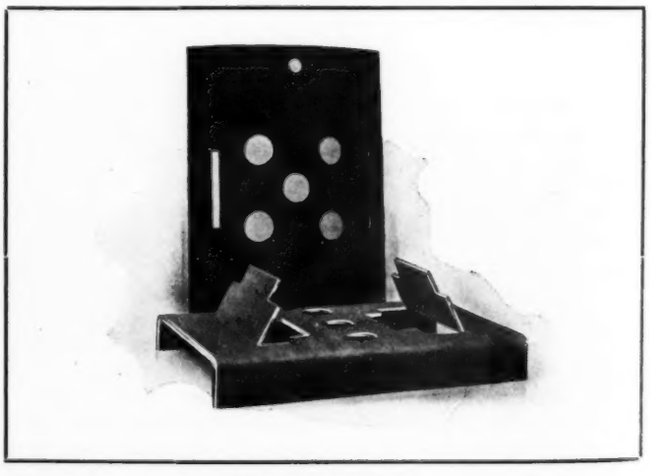
What the Hallet Steel Gain Does.

The literature of the Hallett Iron Works, Chicago, describing the steel gain manufactured by that company, declares that the use of the Hallett does away with the rotting and breaking of poles at the gain, as also with the labor of cutting gains in poles when constructing a line. Brace arms are unnecessary when the Hallett is employed, is the claim, and the steel gain is quickly attached to standing poles.



Gain Attached.

The gains are shown in the accompanying illustrations, both detached and in place. These indicate the manner of their operation very clearly. It is claimed for them that they cost no more than the labor charge for cutting gains in poles and bracing the cross arms; that they prevent weakening of the pole, through the cutting of the ordinary gain; that they strengthen the



Hallett Steel Gain.

pole top, and that they provide means for mounting new cross arms on old poles.

The Hallett steel gains are made of heavy Bessemer steel, either plain or galvanized. The steel gain is being used to an increasing extent every year by pole using companies for holding the cross arms in place on the poles. Full descriptions and prices will be supplied by the Hallett Iron Works upon request.

"Support Competition"

Public Forethought Telephone Competition

Frequently communities are unmindful of the public advantages offered them and only when too late realize that a neglect of their opportunities has caused them serious inconvenience and expense.

The Buffalo public has proven itself wise in offering unstinted support to telephone competition, but we know of many communities which are bewailing their fate because of a neglect to realize the great and lasting benefits to them in a keen and active competition in telephone service.

It is better to be forewarned and protected against the misfortunes of a monopoly than it is to be obliged to form citizens' protective associations and finally pay an everlasting tribute to a telephone monopoly in increased rates and indifferent service.

Those who do not have Federal telephone service can well afford to subscribe *now* and join the large list of Federal patrons.

The responsibility to support the things most important to Buffalo's interest should be shared by all.

Your subscription now to Federal service will assist us to still further help make Buffalo the greatest telephone city in the world—to your lasting financial benefit and convenience.

FEDERAL TELEPHONE & TELEGRAPH COMPANY

"Competition a Public Benefit"

"Support Competition"

Competition vs. Regulated Monopoly

Buffalo (Competition) 3.3 Seconds
Albany (Monopoly) 6.4 Seconds

No better evidence of the value of competition to the public can be given than the report of the Public Service Commission, just out, in which it says that the average speed of telephone operators in answering calls in Albany, under monopoly rule, is 6.4 seconds, and in Buffalo, under keen competition, is 3.3 seconds.

Personal efficiency is essential to good service.

In monopoly the incentive to high personal efficiency is lacking and the *public suffers* in class of service.

In competition the incentive to personal and corporate achievement is limited only by the highest standards of a competitor and the *public benefits* through such efficiency.

The telephone service in Buffalo is of a higher class than in any other city in the United States because of the high standard set by the keen competition of the Federal Telephone & Telegraph Company.

Are you giving full recognition to this very unusual condition?

Your name in the new Federal Telephone Directory now going to press will encourage us to still greater activities in the public behalf.

FEDERAL TELEPHONE & TELEGRAPH COMPANY

"Use Federal Directories"

"Support Competition"

The Telephone Unlike Other Utilities

In electric light, gas and water a governmental commission has an opportunity to accurately measure the quality and quantity of the commodity produced. In street railroads an inspection can easily be had of schedules of running time or conditions of cars for public convenience. But in the telephone no simple methods are available for governmental control of the class of service in the public interest.

The class of telephone service is dependent upon the efficiency of the operator *at the moment* of making the call. The work of the operator is most exacting, is done under high tension and creates a great nervous strain.

The standard of efficiency of such an organization in competition is the highest achievements of its competitor—any other measure would result in service far below such a standard.

Except for competition it would be a mental and physical impossibility to keep a telephone organization keyed up to the individual tension necessary to give the very highest grade of service.

Every telephone user in Buffalo, Federal or Bell, is benefiting by the competitive pace set by the Federal company.

Isn't it worth the price (two dollars a month) to have such a service as this in your home—with the added conveniences and the knowledge that you are doing your share to support this unusual condition for the public benefit and your own?

Let us have your subscription now.

FEDERAL TELEPHONE & TELEGRAPH COMPANY

"Competition a Public Benefit"

"Support Competition"

Monopoly— A Public Misfortune

It has been said of the troubles of the New Haven Railroad that it is weighed down with the spirit of monopoly; that regardless of the efforts of the management it is impossible to bring out a sufficient personal endeavor to create the corporate achievement required of it; that only through an active competitor to set the pace can the public expect to receive the class of service it demands.

Personal endeavor is essential to good service everywhere, but nowhere is it so important as in telephone service, where the class of service given is so dependent upon the individual.

That competition brings out the greatest efforts of man is an indisputed fact, as is well illustrated in the telephone business in Buffalo where not only in the Federal company, but in the Bell company also an unparalleled personal and corporate endeavor is producing a class of service unequalled in this world at a cost to the public far below that in like cities under a monopoly.

The admissions of our competitor to 3.3 seconds service in Buffalo against 5.5 in New York City and 6.4 in Albany only emphasizes this contention and we doubt if the Bell company will deny it.

Buffalo has given strong support to this competition, as is evidenced by the use of our system (fully 200,000 calls per day) and is receiving in return its reward in low rates and good service. RESULT—**A Great Public Benefit.**

Your subscription now to Federal service will give an added assurance for a continuation of a high class of service from both Federal and Bell systems so necessary for the public good.

Let us have your name *today.*

FEDERAL TELEPHONE & TELEGRAPH COMPANY

"Competition a Public Benefit"

Four Advertisements Which Recently Appeared in the Buffalo, New York, Papers, placed by the Federal Telephone & Telegraph Co., of That City, Emphasizing the Advantages of Competition in the Telephone Business, as Opposed to Monopoly.

Practical Applications of the Motor Truck.

There is one motor car made by the International Harvester Co. which has been found to be particularly well adapted to the needs of telephone companies. This is known as Model "M-A." Other I. H. C. trucks, of course, will fill certain specific wants of telephone operation, but

An I. H. C. Car Used at Cincinnati.

for all general purpose, city and suburban use, it is conceded that the model mentioned is especially well fitted.

The illustrations on this and the opposite page show two rather remarkable arrays of I. H. C. Model "M-A" cars, both in Cincinnati. One is a photograph of eleven trucks used by the Union Gas & Electric Co., of Cincinnati. The other shows eleven of the fourteen employed by the Cincinnati & Suburban Bell Telephone Co.

R. T. McComas, assistant general manager of the telephone company, advises TELEPHONY that, as the cars have been in use but nine months, he is not yet in position to make public his data in regard to their efficiency as compared with teams, but he does say that they are giving very satisfactory service.

The company has devised a somewhat unique method of caring for its cars. Thirteen of them are assigned to regular service, one being reserved as an emergency car. On the first working day of each month No. 1 is sent to the garage for a day's overhauling, when such repair work as is necessary is done and the machinery is placed in first class condition. No. 14, the emergency car, takes the place of No. 1 while this is being done. On the second working day No. 2 goes to the garage, being replaced by the emergency car, and thus the process continues in regular rotation until the fourteenth working day, when the emergency car goes to the garage for its monthly overhauling.

This course is pursued every month, whether the trucks show signs of needing attention or not. Each, in this way, is thoroughly gone over every 30 days, with the result that each is in the pink of working condition all the time.

The purchase of I. H. C. cars in such quantity by the Cincinnati & Suburban Bell company was not the result of snap judgment. Representatives of the company first thoroughly inspected the plant of the Harvester company and followed the manufacture of the cars through the various processes, from the raw material up to the finished product; then the first order was placed, which was rapidly followed by others, until the present equipment of 14 was completed.

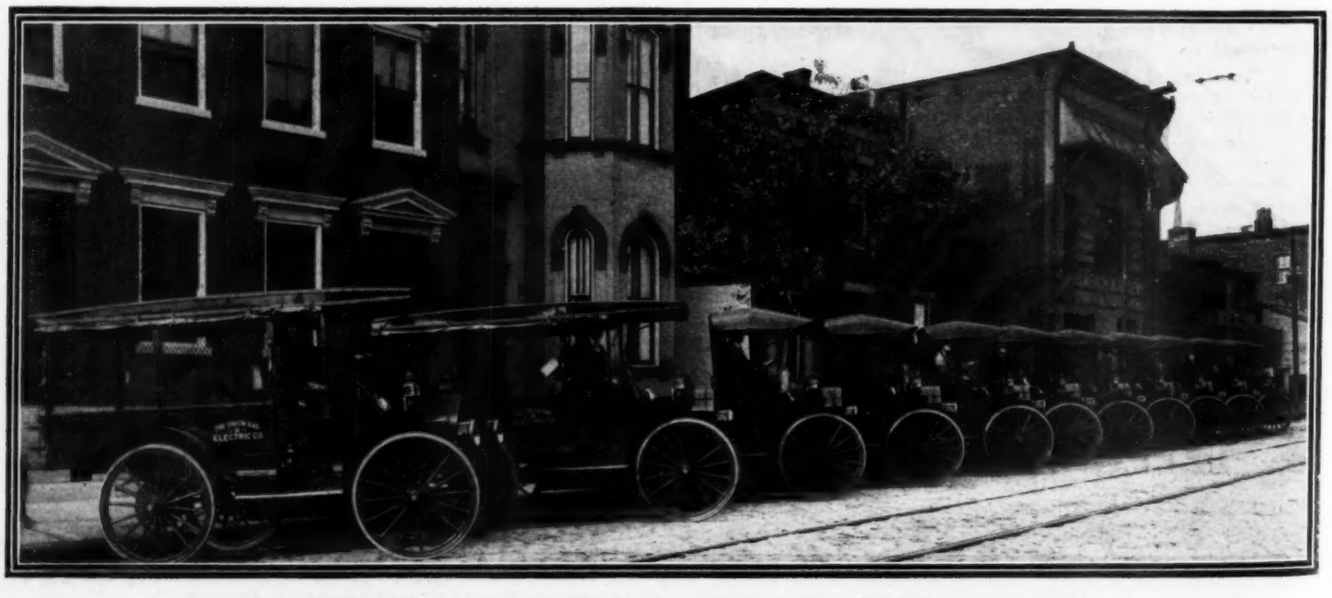
The Model "M-A" is a two-cylinder, 20-horse power truck, with a guaranteed capacity of 1,000 lbs. This guaranteed capacity, however, is very much lower than the actual capacity, the manufacturers preferring to be overconservative in this important matter. The engines, which are suspended on a steel sub-frame underneath the body, are air cooled by a fan opposite the exhaust valve on each cylinder. They are chain drive, from countershaft to each rear wheel; have two speeds forward and one reverse; steer by wheel, right-hand control; and have foot-pedal band brake on differential and internal expanding brakes on rear wheels, operated by hand lever. They are equipped with 38-in. wheels, front and rear, roller bearings, and 2-in. side wire tires.

Full illustrated specifications of the I. H. C. cars, together with prices, will be mailed to anyone interested. Inquiries should be addressed to the International Harvester Co., Chicago.

Two New Red Hot Specialties.

The Ashton Mfg. Co., Newark, N. J., maker of the Red-Hot line of torches and fire pots, is constantly endeavoring to improve its line and calls attention at this time to the No. 57 fire pot, which is made to meet the demand for one to accommodate large soldering coppers and heat a pot of metal at the same time.

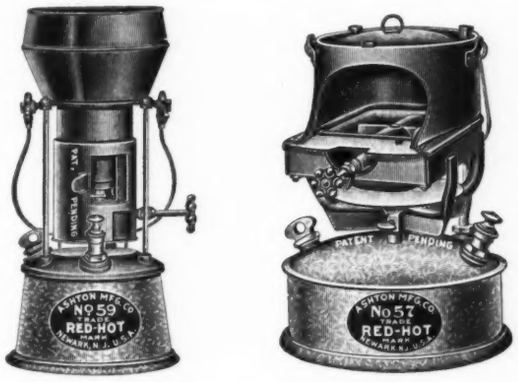
The tank is made of heavy galvanized iron, strong and durable and the burner has double heating surfaces burning from each side to the center, giving, it is claimed.



An Imposing Line-up of International Harvester Cars Owned by Cincinnati Gas Co.

perfect combustion. The company states that it is noiseless, smokeless and odorless and, therefore, can be turned down low if desired, thus saving fuel expense, as there is a sub-flame for the generator and the maximum heat can be obtained on a second's notice.

To meet the demand for a first class kerosene fire pot



Fire Pots for Inside or Outside Use.

at a medium price, where the use of gasoline is prohibited on account of insurance regulations, the company has placed on the market its new No. 59 kerosene fire pot, which is guaranteed to be first class in every respect. If operated in accordance with instructions, splendid satisfaction is promised the user.

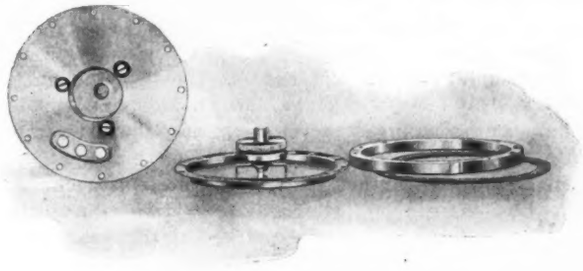
The tank is made of heavy, galvanized iron, with heavy cast top plate and bottom ring protecting the tank, with a center support running through from the top of the tank to the base, making it strong and durable. The burner is made of special generator metal, which retains the heat longer. It is stated that it will work perfectly indoors and out in weather below zero, as the flame is protected by a metal slide or shield.

The Ashton Mfg. Co. says that it has recently closed the most successful year since starting in business. The demand for the Red-Hot line is said to be increasing very rapidly and the prospects for the coming year are very bright. It is declared to be the company's aim not only to please and satisfy the jobber, but also the user of its tools. These latter are guaranteed as far as material and workmanship are concerned for a period of six months. Patrons are assisted in every way possible in increasing their sales and are afforded not only protection but a good margin of profit on the sale of the Red-Hot line.

Transmitter Developments and the Gottschalk Transmitter.

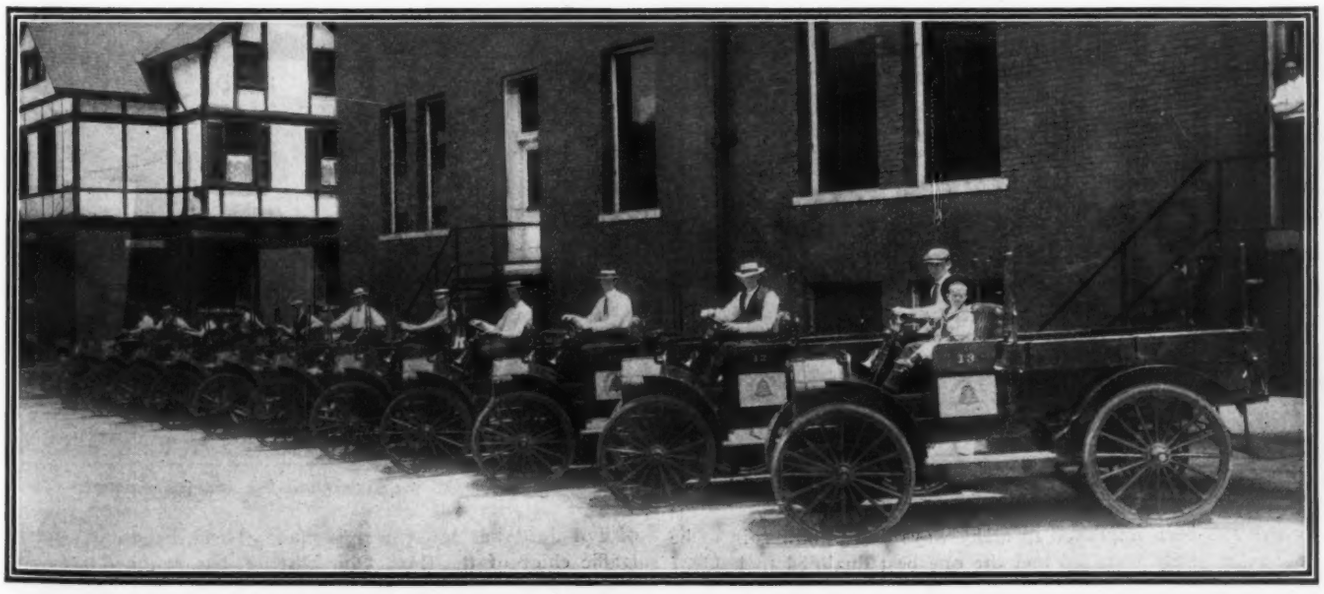
The year 1912 marked a steady improvement in transmitter construction, nearly all of the standard makes having refined the details of their transmitters so as to make them as much more durable and efficient as possible. Among the more noticeable improvements may be mentioned the elimination of the usual rubber band by practically all of the Independent manufacturers, the elimination of rubber or felt tipped damping springs, the elimination of small parts which complicate the instrument and make it expensive to manufacture, and improvement of the quality of the granular carbon employed with a view to removing all impurities therefrom and of producing a carbon free from burning or "frying" and adopted to withstand a maximum of battery current.

With a view to producing an instrument that in addition to the modern features mentioned above would be absolutely water tight so that it could be immersed in water without damage, Felix Gottschalk, of New York, has perfected his improved transmitter in which all the parts are sealed in a water tight chamber. This instrument is particularly recommended for mines, portable telephones exposed to the weather, instruments used on railway sets or shipboard and, in fact, wherever a transmitter is unduly exposed to dampness.



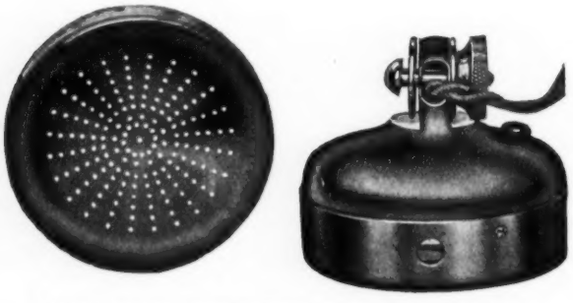
The Gottschalk Transmitter Disassembled.

The Gottschalk transmitter has been further improved by the simplification of the parts, which are reduced to the minimum number, consisting of a cell, a diaphragm, and the casing of the instrument. There are no damping springs, rubber bands, delicate terminal connections, back



The Cincinnati & Suburban Bell Uses Fourteen I. H. C. Wagons Very Satisfactorily.

bridge or other parts. Furthermore the usual flaring mouthpiece is entirely eliminated, its place being taken by a flat perforated metallic guard which is of such construction that there is no tendency for the lips of the speaker to come in contact with it. Transmission of disease under this condition is practically impossible as the lips



Metal Guard.—Transmitter Showing Drain Hole.

do not get against the guard. With the ordinary flaring mouthpiece, the lips are often placed either against the rim or actually inside the annular opening, with the result that any germs that may be on the mouthpiece are conveyed to the speaker's lips. The Gottschalk instrument, therefore, is strictly sanitary, as the danger of contact is removed and it does not afford a lodging and breeding place for germs.

The diaphragm construction of the Gottschalk transmitter is unique, the diaphragm being constructed on strictly scientific lines, thereby insuring the maximum variation in the current flow.

There are many other features of interest in connection with this instrument, which is the first transmitter to make its appearance on the market in the year 1913 and which is said to mark a distinct advance in electrical efficiency and mechanical design.

Alyea Mfg. Co., Incorporates.

The incorporation of the Alyea Mfg. Co., Chicago, has just been accomplished, under the Illinois laws. The company will specialize in the manufacture and sale of the Indiana anchor,

Anchor Closed.

Anchor Expanded.

which has been improved in many ways and is now said to be the most easily installed and the one best qualified to hold of any on the market.

The illustrations show the anchor closed and expanded, the larger drawing indicating the method of expanding it after it has been planted. Describing the Indiana the manufacturers say: "They are made of malleable iron and are practically indestructible. They are expanded in solid earth at the bottom of the hole and securely locked in place by the upward movement of the anchor bar when the strain is applied. When set the pull is on the outer ends, where the strain comes. They are designed to attract the greatest amount of earth for their size—the outer ends turn upward. The only tools required to set the Indiana are an auger and a common tamping bar."

The men composing the Alyea Mfg. Co. are the following: President, C. B. Alyea, for a number of years associated with the engineering and construction departments of the Central Bell Group; secretary and general manager, W. W. Anderson, for several years with the Western Electric Co. in its engineering and sales departments, and recently chief engineer of the Arnold Company's telephone department; treasurer, Graham Van Ness; council, Preston Clark. The two last named have long been associated with the Bell company's engineering department.

Bell May Sell Wisconsin Plants.

A merger of the interests of the Independent and the Wisconsin Bell companies located in Ashland, Washburn, Park Falls, Mellen and Bayfield is now said to be under way, according to advices from Washburn, Wis.

Inventories of the plants of the Bayfield County Telephone Co., and the Wisconsin Bell are now being taken, the plan being for the latter to sell to the Independents.

Changes in Bell Staff at Dayton.

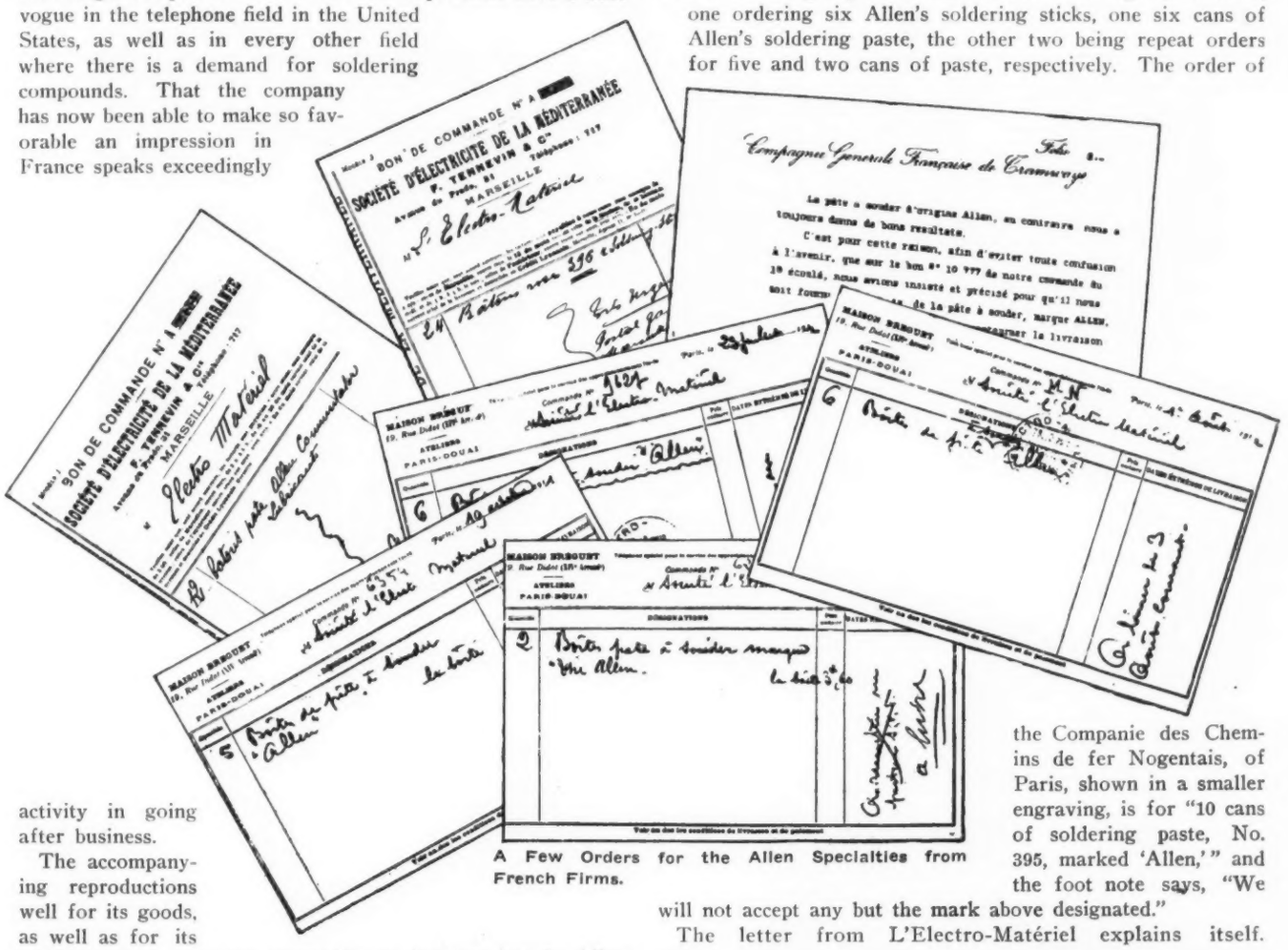
The Central Union Telephone Co. made several changes in its staff at Dayton, Ohio, the first of the year. Following are the changes made: H. C. Sherer, plant superintendent of Ohio, located at Columbus, has been given a position on the general manager's staff. J. W. Cherry, formerly district plant chief of Chillicothe district, succeeded Mr. Sherer, and C. H. Temple,

Expanding the Indiana Anchor.

of Toledo, takes Mr. Cherry's place. H. H. Freeman, district traffic chief of the third Ohio district, has resigned from the company and his position will be filled by F. R. Eckley, of Toledo. Mr. Eckley's headquarters will be at Dayton.

The Allen Line in France.

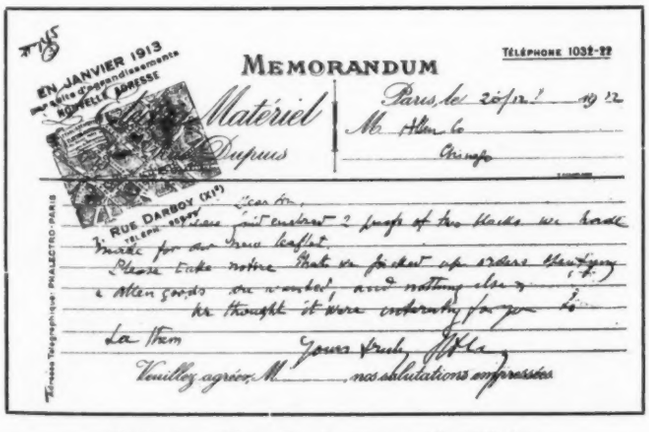
An opening in France which promises well for the future has been made by the L. B. Allen Co., Inc., of Chicago, manufacturing a complete line of fluxes. Allen products have a wide vogue in the telephone field in the United States, as well as in every other field where there is a demand for soldering compounds. That the company has now been able to make so favorable an impression in France speaks exceedingly activity in going after business.



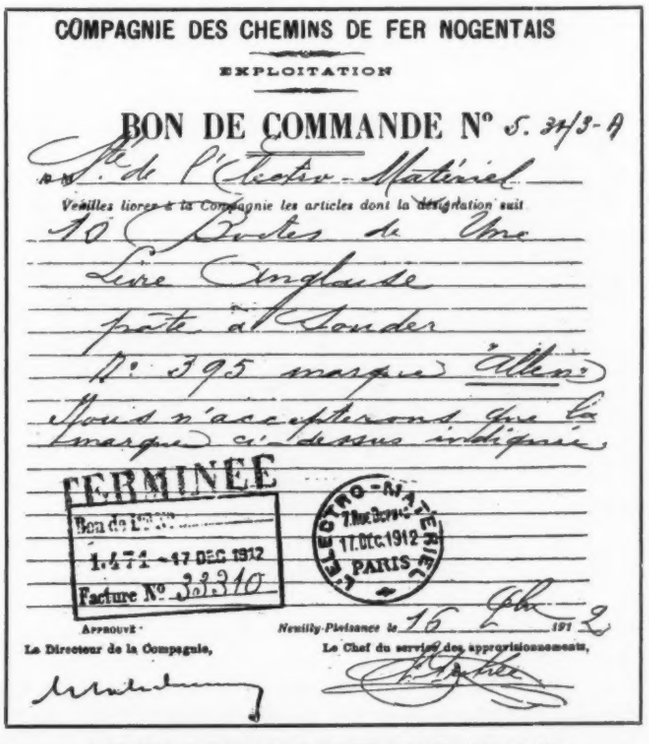
A Few Orders for the Allen Specialties from French Firms.

The accompanying reproductions well for its goods, as well as for its of letters and orders are interesting as showing that the Allen line is growing in favor and is being featured by dealers across the water. The "repeat" orders are also significant. The two topmost orders, in the large engraving on this page, are from the Société de la Méditerranée, Marseilles, one calling for 12 sticks of Allen lubricator and the other for 24 soldering sticks, No. 396. The letter on the right, at the top, from the Compagnie Generale Francaise de Tramways, may be translated as follows: "The soldering paste manufactured by Allen has always given us good results. It is for that reason and the purpose of avoiding any confusion in the future that, in our order No. 10,777 of the 18th ult., we insisted that Allen's soldering paste should be furnished us." The remaining four orders in this group are from the Maison Breguet, of Paris, one ordering six Allen's soldering sticks, one six cans of Allen's soldering paste, the other two being repeat orders for five and two cans of paste, respectively. The order of the Companie des Chemins de fer Nogentais, of Paris, shown in a smaller engraving, is for "10 cans of soldering paste, No. 395, marked 'Allen,'" and the foot note says, "We will not accept any but the mark above designated."

The letter from L'Electro-Matériel explains itself.



Featuring Allen Goods Across the Water.


COMPAGNIE DES CHEMINS DE FER NOGENTAIS
EXPLOITATION
BON DE COMMANDE N° S. 34/3-9
Ste de l'Electro-Matériel
Veuillez livrer à la Compagnie les articles dont la désignation suit
10 Boites de 1me
Livre Anglaise
pâte à Souder
N° 395 marque "Allen"
Nous n'accepterons que la
marque ci-dessus indiquée
TERMINÉE
Facture N° 33310
Nouilly-Plaisance le 16
Le Directeur de la Compagnie,
Le Chef du service des approvisionnements,

Will Not Accept Any but Allen Soldering Paste.

Improvements in Denio Telephone Fire Alarm.

By David G. Dee, Chief Engineer.

In the columns of TELEPHONY, November 2, 1912, we fully explained the methods of the Denio telephone fire alarm system. Since that time the American Telephone Fire Alarm Co. of Chicago, successor to the Denio General Electric Co. of Rochester, N. Y., has added many new features to this system. It now presents these features in improved apparatus, thoroughly adapted for all applications where a fire alarm system is desired.

The advancement described in this article shows radical changes and most valuable improvements to the general plan designed by the Denio company. The existing telephone systems are utilized in such a way that the dual function of giving perfect firm alarm service at the same time with first-class telephone service is brought about, for the alarm system is non-interfering.

The proposition has been proven entirely practical by the test of long service. It has met with universal commendation by telephone officials and fire department authorities from various parts of the country and particularly wherever it has been installed.

To meet demands which have been made for additional service other than the direct transmission of fire alarm calls to fire headquarters, it has been necessary to devise circuits, the description of which is the intent of this article.

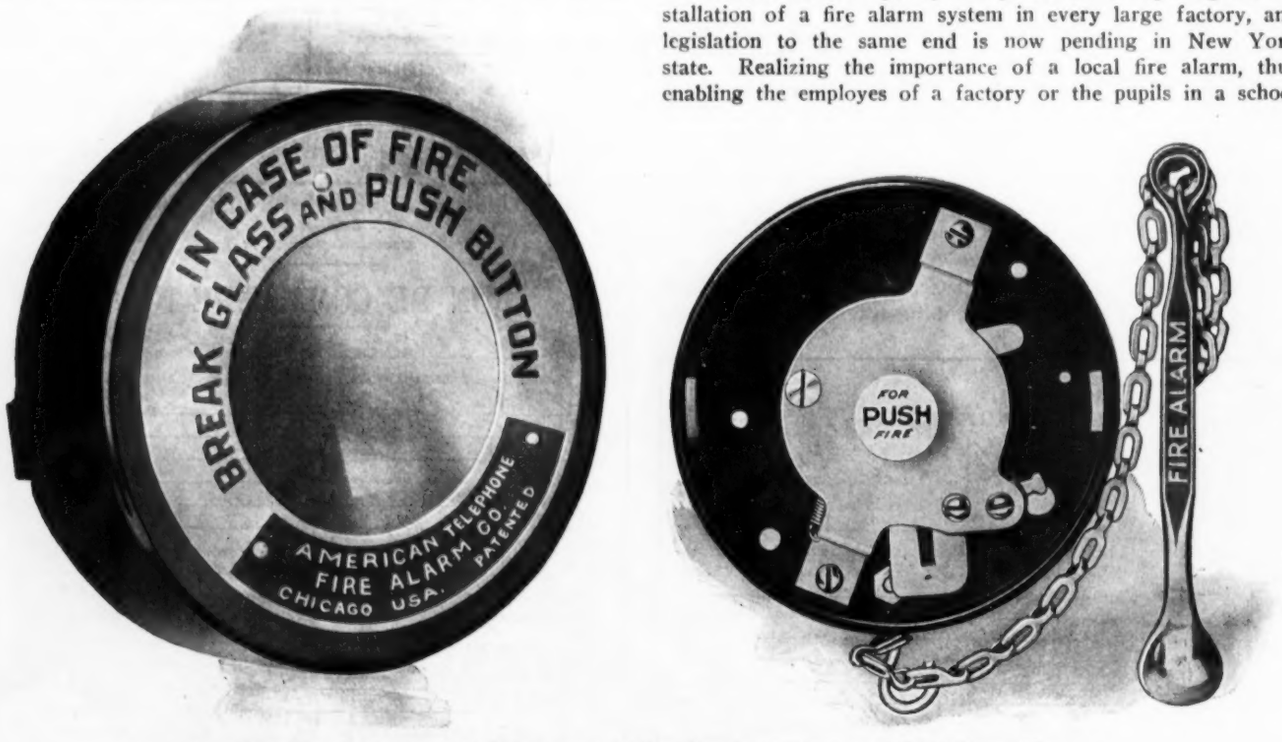
The system is applied to the manual, automatic, Automanual and some types of magneto telephone systems. When operating in connection with the automatic telephone system, a special firm alarm repeater is installed in the telephone exchange. This repeater transmits the fire alarm calls over a special trunk to fire headquarters, where they are received on a recording register. Where the fire alarm boxes are connected to the neto system, special fire switchboard plugs are installed, two to each section of the switchboard, these fire plugs being di-

Fire Alarm Box, Residence Type.

rectly connected to a special trunk to fire headquarters.

The fire alarm box for residence installation, shown in the illustration, contains a spring driven movement which is released when the push button is operated by a person sending in the alarm. The push button is protected by a glass window and a hammer fastened to the box by a chain, affords means of breaking this glass protection. The installation for stores, factories, school houses and other large public and private buildings consists of one master fire alarm transmitter which is controlled by any one of the push buttons located upon various floors of the building.

The state of New Jersey has passed laws requiring the installation of a fire alarm system in every large factory, and legislation to the same end is now pending in New York state. Realizing the importance of a local fire alarm, thus enabling the employes of a factory or the pupils in a school house to be immediately notified in the event of fire, auxiliary circuits were devised to give this local notification.



Exterior and Interior Views of Push Button Box for Factory or School House Use.

The main objection to fire drill systems of the open circuit type, is that the daily testing of the system is neglected and it is often found that the system is in an inoperative condi-

tion when needed. The objection to the closed circuit type of system is that should a wire be accidentally broken, a false fire alarm would result. The Denio system eliminates these chances of trouble, as its entire system is under small current tests, a break in any portion of the floor wiring giving a trouble alarm both at the building and at the telephone exchange. A break, however, does not interfere with the proper operation of the system, as alarms can be sent in when the system is grounded or any portion of the floor circuit wiring broken. The battery, bell circuits, and all fire alarm circuits in the building are under constant test.

The general plan is to install several push button boxes on each floor and in the various sections of the basement. Upon the discovery of a fire, the nearest push button box may be operated by breaking the glass and pushing the button. This action immediately releases the master box mechanism, sending in the fire alarm over the telephone line directly to fire headquarters. The number of the box is recorded upon the register and the attendant by consulting the "running board," knows the exact location of the fire. Thus he is enabled to instantly dispatch the necessary fire fighting apparatus.

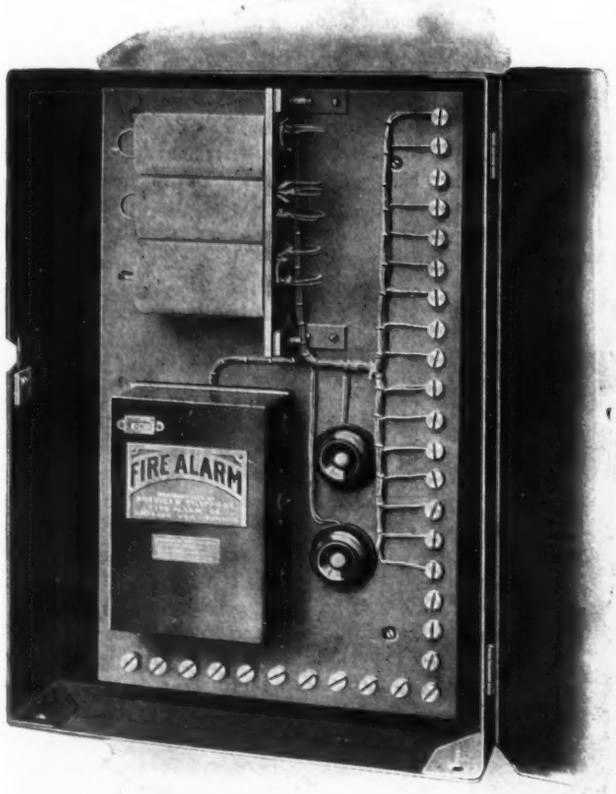
At the building, the instant the fire alarm box is operated, the local alarm bells are rung, giving a code signal denoting fire and the exit which is to be used. This is arranged to meet local conditions. An annunciator on the outside of the building is operated, showing the floor or room from which the alarm has been sent. This provision enables the firemen upon their arrival to immediately go to the trouble.

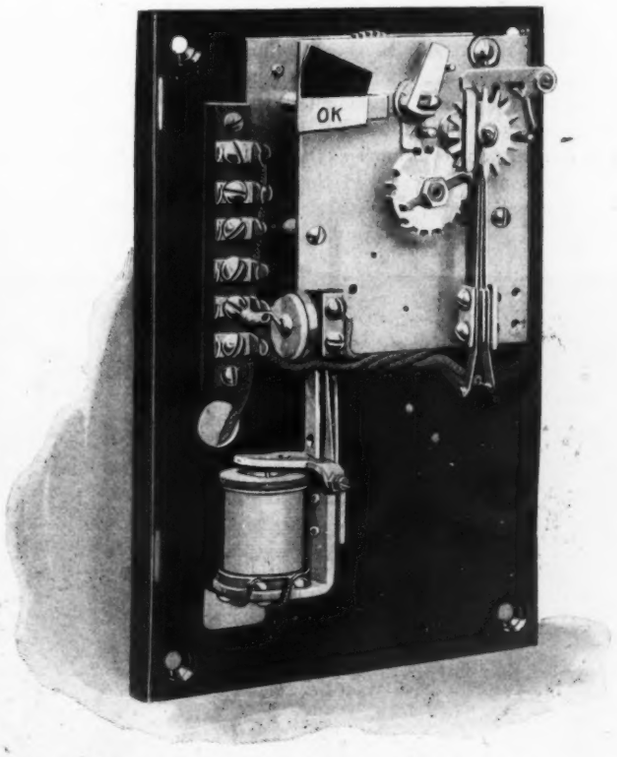
There is a great demand for a thermostatic system, the thermostats to be located in the basement, operating at a temperature of 160 deg. Fahrenheit, thereby automatically giving the alarm in the event of a fire originating there. The old objection to systems of this character, namely, that a false fire alarm due to an accidental operation of a thermostat, may be sent in, has been eliminated by the American company. It uses a system in which it is necessary to have two thermostats operated to send in a fire call.

The wiring scheme is identical with that of a push button system and may be used in conjunction with the push button to control the master fire alarm transmitter. The operation of two thermostats brings about the same results as operating a push button, namely, giving the local fire alarm and sending the fire alarm call to fire headquarters. The wiring is all under constant test. The development of a fault in a thermostat, the failure of a local battery, or a break in any portion of the thermostat circuit, immediately sounds a local trouble alarm and sends a trouble alarm call over the telephone line. This alarm uses the telephone line battery.

Annunciator Outside of Building—Gives Floor and Station Location.

By means of switches located in the principal's office of school or superintendent's office of a factory, test fire drills may be made at any time and the arrangement of the switches is such that they may not be left out of normal position without giving a trouble alarm.





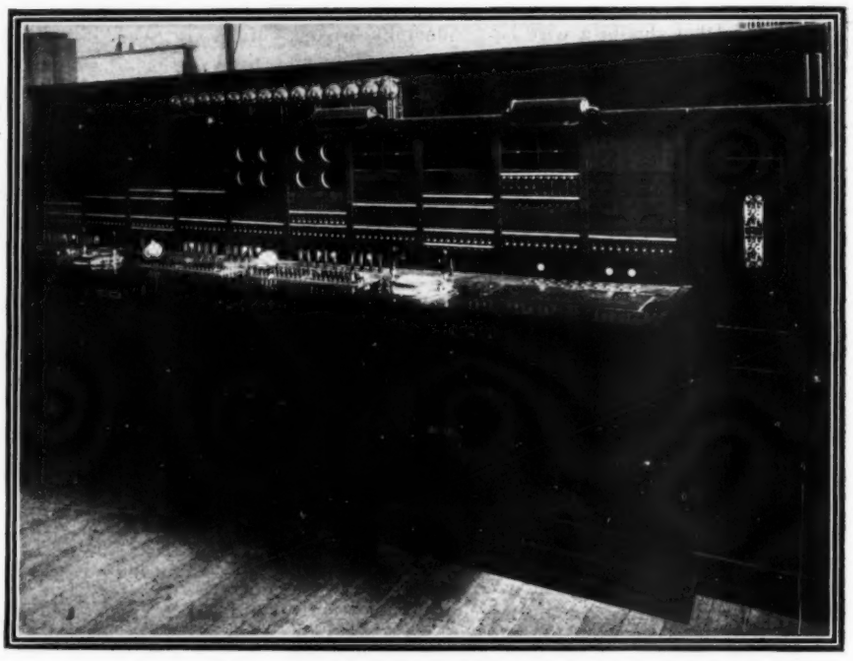
Box Containing Master Box, Test Relays and Wiring Terminals—Rear View of Box Panel.

The general plan is to have a fire drill made at stated intervals, thereby permitting the pupils or employes to become accustomed to leaving the building in an orderly manner when the fire drill bells are sounded. The importance of this is emphasized by the loss of life by fire which has occurred in recent years without constant frequency.

The Automatic at Geelong, Australia.

At 11 o'clock Saturday night, July 6, 1912, the new automatic telephone exchange at Geelong, Australia, was cut into service. This being the first installation of automatic telephone equipment in Australia it had been looked forward to with a great deal of interest by the Post Office officials, under whose jurisdiction the telephone systems are operated, as well as by the public at large.

The Melbourne Argus, commenting on the cut-over had the following editorial in the issue of July 9: "Not the least striking of the achievements of modern inventive genius are those directed towards the perfection of the telephone. The strides that have already been made are nothing short of wonderful. A couple of years ago the common battery system, when installed in metropolitan exchanges, was hailed as a time-saving, temper-sparing advance upon the old switchboard, but the glow-light idea is now a back number. Geelong is served by the latest thing in telephonic systems—an automatic telephone, by means of which every subscriber becomes his own connecting agency, and the bulk of the old worries of telephone users disappear."

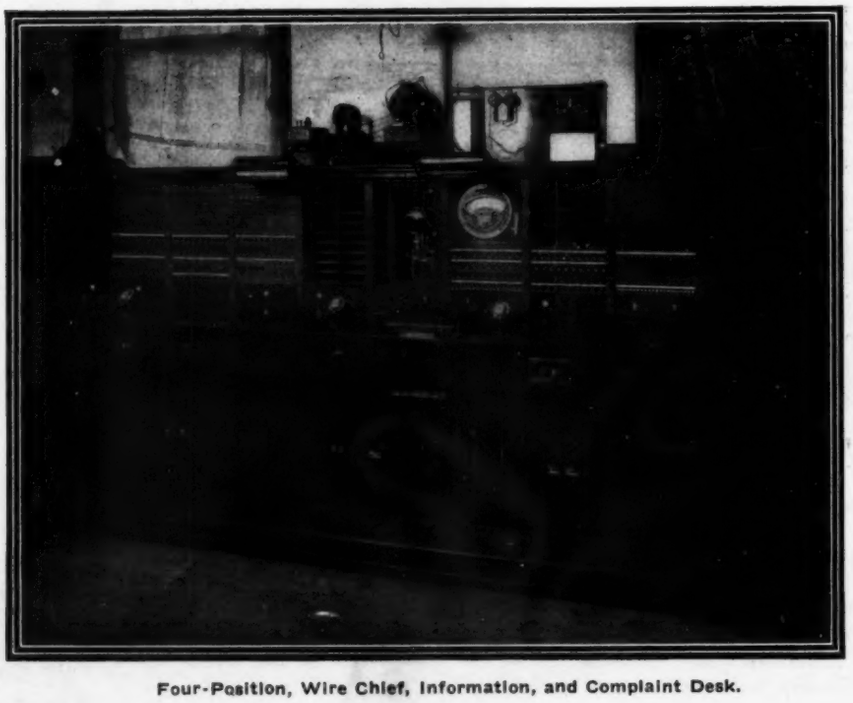


Toll Board in Geelong, Australia, Automatic Installation.

Due to the fact that the cut-over was made near midnight the traffic immediately thereafter was not very heavy, but on the following two days the system was used quite freely by the subscribers in experimenting with the new type of apparatus and much praise was given on account of the excellent operation of the system. The records for the first two days the equipment was in service showed only 14 cases of trouble reported, which is remarkable for a complete cut-over.

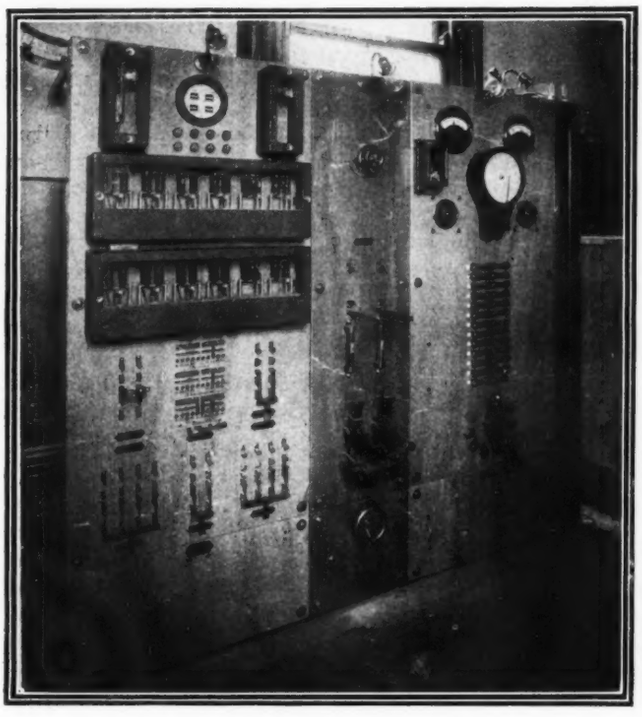
The central office equipment consists of 900 independent lines, 100 four-party lines and 100 lines to be used for trunks to and from private branch exchanges. The switches for these latter lines are so arranged that any number of trunks may be connected to any one particular private branch exchange system using the same terminal number for all trunks, a call being made to the private branch exchange selecting the first idle trunk. Each one of the independent lines is equipped with a meter for recording the number of messages originating from that line; this meter, however, does not operate until the complete call has been made, that is, until the called subscriber has answered the telephone. For metering party line service, a meter box is installed at the subscriber's instrument. In making a call from a party line telephone, the subscriber will complete the connection in the usual manner, but will be unable to carry on a conversation as the receiver of the calling instrument will have been shunted and the transmitter springs shorted. When the called party has answered, which will be heard indistinctly by the calling party, the latter will press a button associated with the meter box, thus restoring the talking circuit to normal and registering the call.

One of the photographs reproduced herein shows five of the line switch units upon which are mounted 500 independent line switches, the meters associated with which are mounted in the upper part of the unit. These meters are very compact, mounted in dust-proof cases and can be read without removing the covers. The meters will operate over a line resistance varying from 0 to 1,500 ohms without any change of adjustment and do not register a call when "Information," "Complaint," "Long Distance," or any official of the telephone department is called by the public. The main distributing frame has 150 pairs of protectors and 208 pairs of line clips to the column. The heat coils have a resistance of 150 ohms and are guaranteed to blow on ¼ ampere in 2½ minutes and to operate on a flow of .3 of an ampere in 10 seconds and carry .2 of an ampere indefinitely. Five ampere fuses enclosed in magnesia fire proof covers are provided and mounted on the main distributing frame. These were required by the government engineers, as no protection is provided for at the cable terminals in the outside plant.



Four-Position, Wire Chief, Information, and Complaint Desk.

The batteries are of the chloride type,

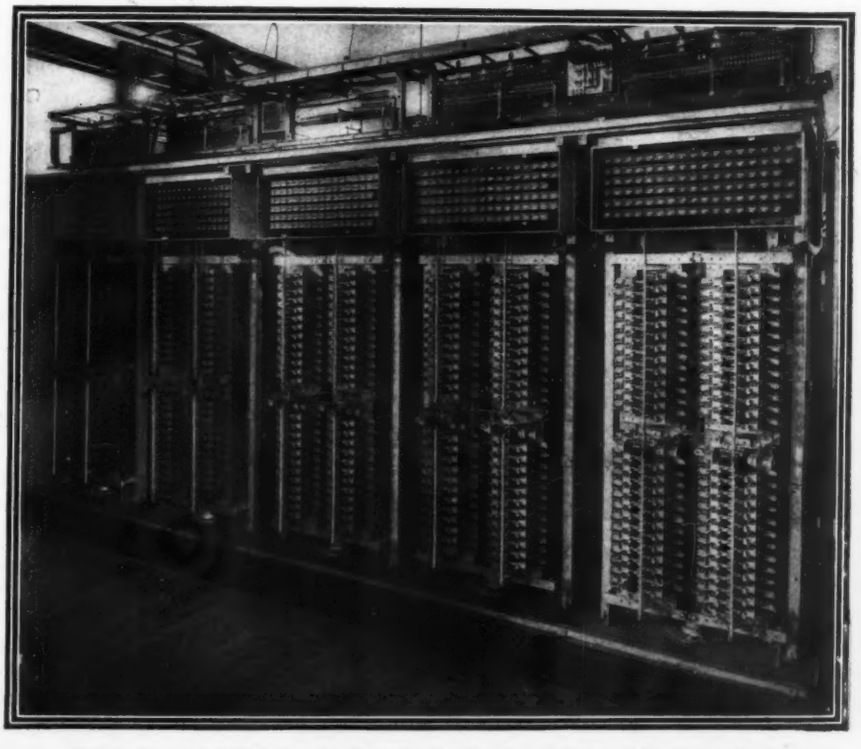


Power Board and Ringer Panel.

having sufficient plates to deliver 240 ampere hours. The cells are wood, having a lead lining and have an ultimate capacity for sufficient plates to give an output of 560 ampere hours. Counter cells are provided to be switched in series with the main battery to keep the voltage at the proper level. Two sets of charging machines are provided, one consisting of a motor generator and the other a gas engine, direct connected to a generator. These machines are so arranged that they can be connected in multiple with the storage batteries to furnish current to the switchboard, or can be used to operate the switchboard independently from the storage batteries. The machines are so wound as to automatically regulate themselves so that the voltage will not operate below 46 volts, nor rise higher than 52 volts when delivering current varying from full load to 1/15 thereof. The ringing apparatus consists of harmonic converters mounted in duplicate on a power panel erected alongside of the main power board. On this same panel are mounted the ringing interrupters and busy back signaling apparatus.

The installation also includes a two section, four-position toll board equipped with 60 toll lines, which are multipled in each section. Two calculagraphs are provided and each position is equipped with eight pairs of cord circuits which have double supervision. All circuits represent the most modern development in toll board equipment. A two-section, four-position wire chief, information and complaint desk has been furnished which is thoroughly equipped to meet all the demands made upon such desks. The telephone instruments are of the Automatic Electric Co.'s standard type, equipped with series receiver requiring no induction coil. All of the equipment and desks were manufactured by the Automatic Electric Co., of Chicago, and installed under the supervision of its Australian representatives, the Automatic Telephones Australasia, Ltd. Credit should be given the manufacturer for the excellent manner in which the apparatus was packed for foreign shipment, the only piece of breakage found upon unpacking, being one of the panels of the power board which was very easily and quickly replaced.

The result of the Geelong installation has been so successful that the Australian government has called for tenders covering automatic equipment for all or part of the cities of Perth, Sydney, Adelaide and Melbourne, and has just awarded a contract to the Automatic Telephones Australasia, Ltd., representatives of the Automatic Electric Co., of Chicago, for 4,800 lines of automatic equipment to be installed in the district exchanges of Balmain, Newton and Glebe, of the Sydney area. The equipment will be manufactured in the Chicago factory of the Automatic Electric Co.



Group of Independent Line Switch Units, with Service Meters, Geelong.

The Wireless Cable Tester.

The Electric Specialty Mfg. Co. of Cedar Rapids, Iowa, reports that the year just closed has been the best since its Wireless Cable Tester was placed on the market.

A goodly number of orders have been received from foreign countries and the immense amount of cable which has been installed in this country during the past year has made a big demand for cable testers.

The manufacturers of the Wireless Cable Tester say that if it is possible to locate trouble without cutting the cable the Wireless will do it.

New Portable Insulation Test Set.

A new type of portable insulation testing set is being placed upon the market by the Leeds & Northrup Co., Philadelphia. The important features of the new set are sensitivity of the galvanometer, compactness, and ease of repairs to the galvanometer, should such repairs ever be necessary. The instrument is shown complete in Fig. 1. It measures, when the box is closed, 9 in. by 4 in. by 4 in. When the containing case is to be closed, the telescope, which is mounted on bearings, is lowered into a position parallel to the long axis of the box.

The sensitivity of the galvanometer is such that an E. M. F. of 1 volt through a resistance of 20 megohms will cause a deflection of 1 scale division. The resistance of the galvanometer is about 225 ohms, and its period about 2.5 seconds.

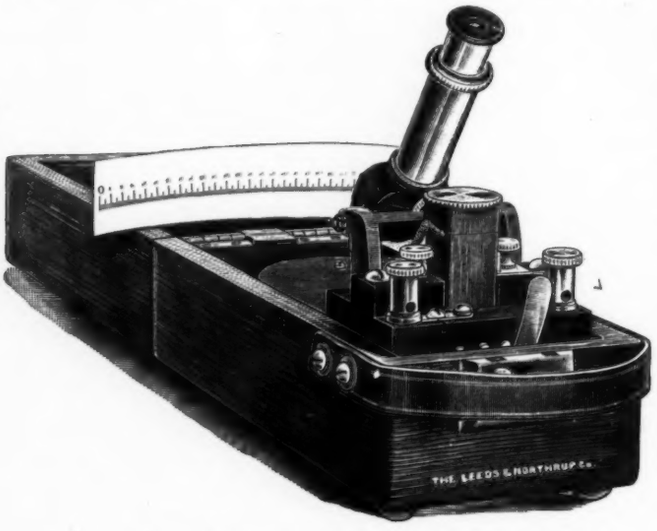


Fig. 1. General View of Insulation Testing Galvonometer.

An Ayrton Universal Shunt and a standard 100,000 ohms resistance are mounted in the case with the galvanometer, making the set complete for insulation measurements, with the exception of the testing battery.

It is claimed that the galvanometer will withstand more rough usage than an ordinary voltmeter. Every galvanometer, however, no matter how constructed, is liable to damage due to excessive jars. Although this instrument is particularly robust, special care has been taken in its design to simplify the question of repairs. A scheme of construction has been adopted which will allow of repairs being made at a minimum of cost and time. The moving system is contained in a separate unit. This unit is shown in Fig. 2. When in use it is slipped between the pole faces of the magnet and secured by thumb screws. Should the system require repairing, this unit is removed from the instrument and sent in to the makers by mail, its weight being less than four ounces. Upon its receipt, with an order for repair, it will be either repaired and returned within one day, or, if they are unable to return it immediately, a new unit will be sent, the units being interchangeable.

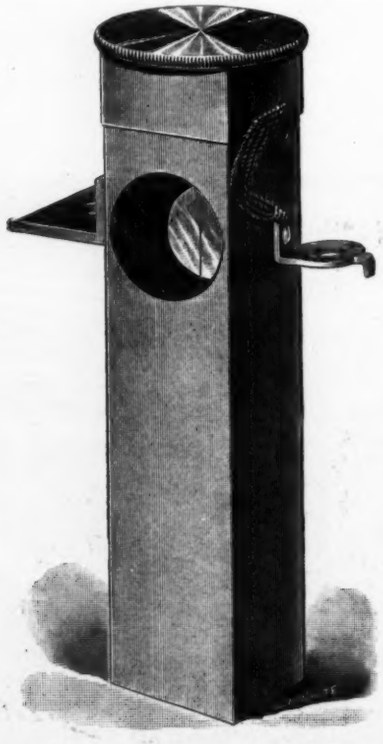


Fig. 2. Moving System Unit.

If a high sensitivity portable galvanometer only is required, the instrument can be furnished without the Ayrton Shunt and 100,000 ohms resistance.

The Leeds & Northrup Co.'s bulletin No. 240 describes these instruments. The company will be glad to send a copy to those interested.

The Calculagraph.

Time is the chief commodity in the markets of the world. The amount of cash paid for labor and for service on a time basis exceeds that paid for any other article of merchandise. And yet there is no other item of commerce so carelessly weighed or measured. Also there is no other article of value so recklessly wasted.

A manufacturer in the early days and, indeed, a few of his more modern successors, when fixing a selling price on one of his products, would "heft it," decide that the material in it probably cost about 75 cents, mentally "calculate" that the labor must have amounted to about three dollars, entirely ignore the matter of "expense," and decide that "we can afford to sell that for $10." He was willing to take a chance on making a few hundred at that figure and, of course, if competition arose, the selling price was cut to meet it—in the same gambling spirit. When the annual inventory was made, if there were found an increase of assets over what was on hand at the beginning of the year, it merely proved that the factory manager was a good guesser.

The Calculagraph.

At a later period, increased competition in the various industries and a consequent narrowing of the margin of profit made imperative some effort toward conservation of time and expense in manufacturing. The early attempts at measuring time of employes were rather crude. Sometimes a slate and pencil were provided each employe, who was expected, at the end of each day, to write down on it the time he expended upon each job during the day. By this method the workman became the guesser instead of his employer, and few of them had good memories.

A later improvement in method required the workmen to write on a card the time of day he commenced work on each job or operation, and again the time of day he finished it or stopped work. These "time-of-day" records must then be subtracted, the one from the other, by a clerk before they could serve any useful purpose; and in these arithmetical operations many clerical errors occurred. Moreover, the workmen would make some errors in recording the time and unscrupulous workmen might juggle the records—putting more time on one

Little Things do Count

Take Tie Wires for example—you probably make them from your "scrap copper" and they're such a little thing you don't consider that they count.

But they do.

Sell the scrap copper as scrap and you'll get enough to buy twice as many Copper Clad Steel Tie Wires. They'll come in nice bundles, cut accurately to length, instead of a bunch of snarled wire which must be cut by hand.

They're strong—they don't rust—and they cost half as much as copper.

You can make money for yourself and happiness for your linemen by using Copper Clad.

Trade Mark
"Weld Clad"

Duplex Metals Company

Chester, Pennsylvania

CHICAGO OFFICE
853 Peoples Gas Bldg.

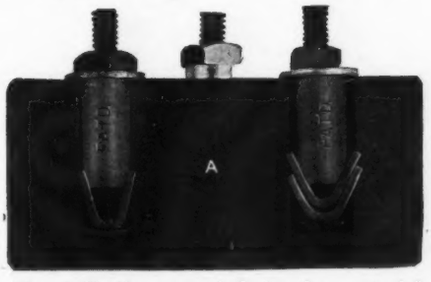
NEW YORK OFFICE
30 Church Street

"NEVER-GIVE-UP"

The PAINE EXPANSION SHELL

Exact Size
No. 1 Shell
for ¼" bolt.

No. 1 Shell
Expanded
with two cups



No. 1 Shells expanded in the material with one and two cups. This shows clearly the *extra* expansion *gained* with two cups in large hole.

Exact Size
No. 2 Shell
for ⅜" Screw

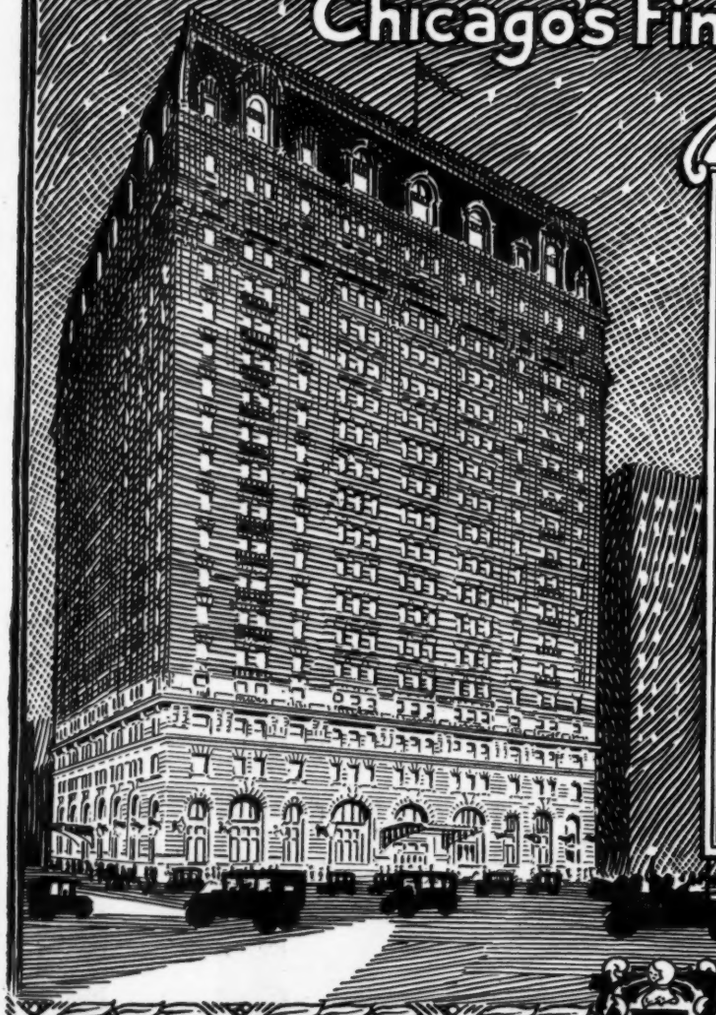
No. 2 Shell
slightly Expanded
with two cups

You can install Paine Expansion Shells with one hand in a third the usual time. They are guaranteed to hold beyond the shearing strength of the bolt. You can use them in anything hard. They will not split or injure marble or tile. Made of steel in 32 sizes. *Let us send you some samples.*

Paine Company, 1316 Corn Exchange Bank Bldg., Dept. C **Chicago, Ill.**

Hotel La Salle

Chicago's Finest Hotel



RATES:

One Person	Per Day
Room with detached bath	$2 to $3
Room with private bath	$3 to $5
Two Persons	Per Day
Room with detached bath	$3 to $5
Room with private bath	$5 to $8
Two Persons	Per Day
Two connecting rooms with bath	$5 to $8
Four Persons	Per Day
Two connecting rooms with bath	$8 to $15

Suites: $10 to $35 per day

ERNEST J. STEVENS
Vice Pres. and Mgr.

La Salle at Madison St.

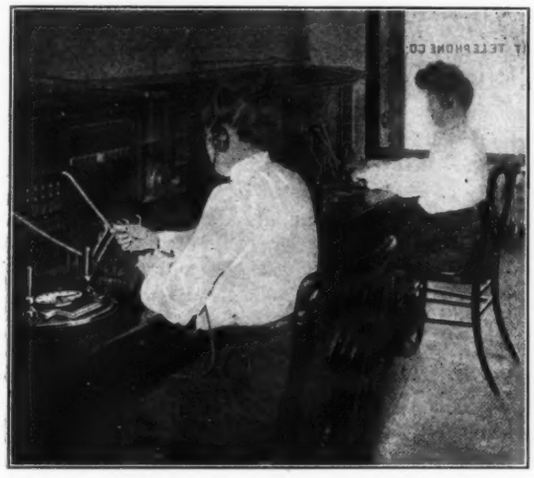
THE popularity of a hotel is determined by its location, its equipment, the spirit of its management and its service. By the excellence of these things Hotel La Salle has won the approval of the public.

Hotel La Salle gives more for the price you pay than any other hotel in Chicago

Please tell the Advertiser you saw his Announcement in TELEPHONY.

job and less on another if it appeared to their advantage to do so.

About forty years ago, an ingenious fellow produced a machine to stamp or print the time which was shown on the face of a clock. This device became very useful in many industries and marked a distinct step forward in the art of recording time. Numerous imitators and improvers have produced machines for recording workmen's time, but all have conformed to the habit formed when the pencil was the tool and several "time-of-day" records were made upon one card to be later laboriously copied, subtracted, and classified by an accountant.



In Position on the Telephone Switchboard.

About 15 years ago, it occurred to an observing individual that the time of day, per se, has no value; that the time of day is never bought or sold; that a workman was not paid $2 because he arrived at 7 o'clock a. m., but because he worked 10 hours; that a telephone company did not charge a customer $1.25 because he had used one of its toll lines at 10:30 a. m., but because he used that talking circuit seven minutes—in other words, that all the records of "time-of-day" it were possible to make by any available means had no actual value, until some one first converted the records into *elapsed time* by the operation of subtraction. Expired or elapsed time was the thing of value which required conservation.

And so the Calculagraph came to be built. It was designed to meet a crying need. It mechanically subtracts one "time-of-day" from another "time-of-day" and prints the difference—the *elapsed time*.

The Calculagraph, which is made by the Calculagraph Co., New York City, is provided with two operating levers which project vertically above it. One of these levers is operated at the beginning of a period of time and the other lever at the end of the period. The resulting record is made on a card, which is placed in the machine prior to each such operation and which is an exact measure of the time which intervened between the two operations. There is no possibility of "clerical errors" and there is no chance for falsifying the record by tampering with the machine.

Several different models of the Calculagraph are made, arranged for recording time in different denominations. The "Model 6" records elapsed time in minutes and fractions of a minute, and is used, it is declared, in every telephone exchange in the United States and Canada where a considerable amount of toll business is handled. This type of Calculagraph is also the standard apparatus for timing toll messages in every country in the world where telephones are used.

In the telephone industry the Calculagraph has saved an immense amount of clerical labor, has insured accuracy in recording the time of the use of toll circuits, enabled telephone companies to collect pay for all "excess minutes" and thus has directly added large sums to their revenue. The Calculagraph also made possible many changes in operating methods, with resulting economies, and was the immediate cause of a large reduction in the charges to the public for telephone toll service.

One type of Calculagraph records elapsed time in hours and minutes, and another model in hours and tenths of an hour. These are very extensively used in manufacturing plants and in other industries where large numbers of persons are employed. The records are used in making up pay rolls, figuring the cost of products, determining equitable piece rates, learning the hourly expense charge, for ascertaining whether or not premiums or bonuses have been earned, for making time and efficiency studies, and for a variety of other purposes.

Many thousands of Calculagraphs are in use and they have very largely contributed to *the conservation of time*—the most valuable commodity in the world.

Telephone Inventions and Special Apparatus.

"The opportunity for the sale of inventions relating to telephony was never better than during the past year, provided the inventions were practical," said H. R. Van Deventer, of Van Deventer & Warren, of Sumter, S. C. This firm, it is said, has the unique distinction of operating the only laboratory in the United States especially fitted up and adapted to the development of telephone inventions and the making of special apparatus.

"The tremendous expansion of the telephone industry in the last few years," said Mr. Van Deventer, "has brought into existence the necessity for improvements in existing methods and apparatus, and a need for new devices and systems."

Van Deventer & Warren make a specialty of investigating inventions, particularly those in crude form before they have been patented, advising what an invention is worth, whether or not there is a demand for it, whether it is practical and

H. R. Van Deventer. **R. M. Warren.**

marketable, how it compares with others of its kind and what the cost of production will be.

Often a preliminary report of this character will show that the invention is limited in its application, or for some other reason would not prove a profitable undertaking, and in such a case the inventor is promptly notified, the reasons being set forth. This eliminates the expense of taking out a patent which would not prove profitable.

On the other hand, if the invention has a field and is practical, it is taken into the shop, a working model is made, the idea is refined and perfected, the various parts being sim-

plified so they are easily and cheaply produced, and patent applications are filed, the papers being prepared by Mr. Van Deventer, who has a practical knowledge of telephone work as the result of 18 years' practical experience.

This procedure insures a marketable device, properly protected by a correctly drawn patent application, which, when allowed, is of some value and not merely a paper patent of doubtful validity and scope.

Associated with Mr. Van Deventer is R. M. Warren, a mechanical engineer, who has been actively engaged in the design and manufacture of telephone apparatus for many years. Mr. Warren's experience as a practical manufacturer of telephone apparatus enables him to design telephone appliances, so they are easily manufactured. The success or failure of telephone equipment depends in a large measure upon the perfection of apparently insignificant details. Often the failure of a single contact in a system will cause endless trouble and necessitate difficult adjustments. Modern apparatus must be so designed that all parts are easily accessible. Modern instruments must be practically "fool proof" and maintenance charges eliminated by ruggedness of design and construction. This is Mr. Warren's specialty.

Van Deventer & Warren do no manufacturing, but, from being in touch with telephone men all over the United States, they realize that a demand exists for special equipment that the regular manufacturers do not furnish. For instance, some exchange manager may have evolved a certain circuit to meet certain conditions which may exist only in his exchange, and for this circuit he requires certain special relays; or, as happened in one case, an intermittently operating circuit closing device where there was no electric power available to operate the usual type of motor. Sometimes it is a waterproof telephone instrument, or a special form of drop, or parts to fit some type of switchboard no longer manufactured. Van Deventer & Warren will be pleased to correspond with parties regarding such special equipment or to give unbiased reports as to the best type of regular apparatus suited to a given need.

Mr. Van Deventer is well known to telephone men as the author of Telephonology. For many years he has been actively engaged in the manufacture of telephone apparatus. The laboratory at Sumter, S. C., is completely equipped, and although recent addition has been made to the laboratory staff, everyone is now working over-time, this evidencing the steady growth of the telephone industry as a whole, as shown by the increasing number of inventions, especially those relating to refinement in details of apparatus and the development of special equipment for special needs.

The Flint Sanitary Mouth-Piece.

The Flint Sanitary Mouth-piece Co., Boston, Mass., which furnishes a detachable, sanitary mouth-piece, said to be the only one on the market, reports remarkable success and a great increase in the circle of its friends during the past year. There have been a number of so-called sanitary mouth-pieces placed before the public, but none, it is claimed, has had the qualities necessary to bring about a successful business, because of defects in one form or another. On the other hand the Flint company presents an article that is declared to meet every objection, either from a sanitary or a mechanical standpoint. Being made of a very tough flint glass, it admits of any form of sterilization, even boiling water having no injurious effect upon it.

The Flint.

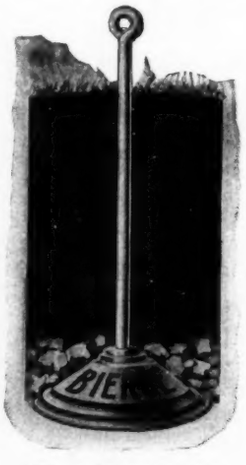
"In mechanical construction," says the company, "the best telephone engineers have agreed that there can be no objection to its use. Therefore, the public, which has been fast learning the dangers lurking in the old form of mouthpiece, is rapidly adopting this method of protection to their health.

"A prominent physician writes the company that 'certainly no one conversant with the facility with which infection occurs can discount the advantages of a mouthpiece that can be readily disinfected.' Dr. S. H. Meuer, of New York, writes us: 'Your mouth-piece is an advance to science and a step further toward the eradication of infectious diseases through the necessary channels of every day communication. There is no doubt that diseases are communicated to the healthy and innocent individual by means of the speaking mouth-piece of the telephone and I must admit that the Flint sanitary mouth-piece lessens the danger to a minimum.'"

There can be no question of the desirability of having a mouth-piece that can be readily cleansed and sterilized as frequently as desired, without in any way interfering with the transmission. This need, it is claimed, is fully met in the Flint sanitary mouth-piece. The company that first takes this forward step, it is urged, will have the support of the public.

Additions to Specialty Device Line.

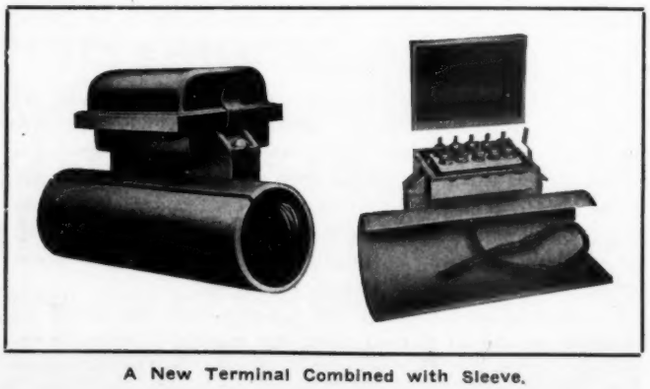
In June, 1912, the Specialty Device Co., of Cincinnati, placed on the market the Bierce Anchor and now reports that the progress made since that date has been remarkable. During the past year there have been three very elaborate tests made of different makes of anchors and the results shown by the Bierce in these tests, the company states, were most gratifying. It has now been adopted by many telephone, telegraph, railway and electric light and power companies as their standard.



The Bierce Anchor.

The Specialty Device Co. has also introduced a new terminal, which comprises both the sleeve and terminal in one piece. This terminal has been in use by the Louisville Home Telephone Co., Louisville, Ky., for many months and is giving entire satisfaction. Its neat and attractive appearance, together with the fact that it eliminates a great deal of field work in its installation, are points in which the general telephone field will be particularly interested.

"The year 1913 is starting off with every appearance of being a banner year in the industry," said F. N. Bierce, secretary of the company, to a representative of TELEPHONY,



A New Terminal Combined with Sleeve.

Does Business Education Pay?

Ten years ago "Business Education" was only a phrase. Today it is recognized as the most important factor in increasing earnings and profits. *The more a man knows about business principles and methods the more he is worth to himself and to his associates.*

This is a day of specialists, but not of petty, narrow specialists. To be thoroughly efficient a man must understand not merely his own department, but the business as a whole. If he is to be more than a mere cog in the machine he must have a knowledge of the basic principles of Economics, Organization, Accounting, Finance, Advertising, Selling, Credits, Costs and Commercial Law.

There is a steadily increasing demand for men who are able to assume large responsibilities. *Such* men are eagerly sought—in fact, the demand is greater than the supply. Hugh Chalmers, president Chalmers Motor Car Co., says: "The only famine in this country is the famine for $10,000.00 a year men." W. C. Brown, president New York Central R. R., says: "The demand for competent men to fill places of responsibility far exceeds the supply in almost every line of business." Theodore W. Vail, president American Telephone & Telegraph Co., said only recently that his company had thirty $10,000.00 a year positions ready for men who could fill them. **This country never offered better opportunities to trained men than it does to-day.**

The Call of Business Leadership

Business leadership depends to-day on native ability, plus organized business knowledge. The brains, energy and ambition you must supply. *The organized business knowledge may be obtained through the Alexander Hamilton Institute.*

The Institute meets the demand for more complete and scientific knowledge of the principles and practice of Business—*the basis of efficiency.* It recognizes the fact that Business like Law and Medicine, is rooted in science, and it makes that science available in a practical way to men already engaged in business. The purpose of the Institute is to bring to your office or home the best thought of university and business specialists in the fields of

Accounts, Finance and Management

The Course and Service is carefully planned and skillfully conducted by some of the foremost business educators in America, acting in cooperation with prominent business executives. It parallels closely the work of the leading university schools of commerce.

The work of the Institute appeals both to the executive who seeks new viewpoints on business problems, and to the young man ambitious to reach an executive position. The Course is being followed and indorsed by officers and department heads of Bell and Independent Telephone Companies throughout the country, and of such important business concerns as Panama Canal Commission, United States Steel Corporation, National Cash Register Company, Burroughs Adding Machine Company, Stone & Webster, H. M. Byllesby & Co., and hundreds of other important business and financial institutions.

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Answer These Questions

Do you want to increase your efficiency, your earning capacity and your profits?

Do you agree with Frank A. Vanderlip, President, National City Bank, New York, that "the man whose education is finished is the man who has marked with definiteness the limits of his progress?"

Are you following any systematic plan to increase your knowledge of business principles?

Are you fully prepared to take advantage of those opportunities that business life sooner or later bring to us all?

Organized business knowledge is no more intangible than good will; it is as imperishable as land; it is more certain to produce profits than plants and machinery.

If you would like to know more about Organized Business Knowledge, it will please us to send you an interesting booklet dealing with that subject. A request for this booklet will place you under no obligations whatever. Address your communication to

Alexander Hamilton Institute

Astor Place **New York City**

Julius Kruttschnitt, director of maintenance and operation, Southern Pacific Railway—"It has given me pleasure to enter as a subscriber."

F. E. Jamieson, general agent Carnegie Steel Company—"It is of immense advantage to those whose business interests are along special lines and who do not have the opportunity of a wider experience in commercial training."

S. G. McMeen, president Columbus Railway and Light Company—"My experience with the Institute leaves me only with the regret that I did not make contact with it at an earlier time."

H. D. McBride, general superintendent of traffic, Southwestern Telegraph and Telephone Company—"A most valuable investment, the cost of which is small as compared with the resulting increased efficiency and earning power of the salaried man."

J. P. Bell, assistant treasurer Standard Underground Cable Company—"Your course points out practical methods for improving one's own line of business endeavor."

N. A. Hawkins, commercial manager, Ford Motor Company—"Your course constitutes a splendid equipment for any business executive, bringing, as it does, directly to him, essential principles boiled down in plain, matter-of-fact form by men who know."

E. E. Watson, factory manager Herring-Hall-Marvin Safe Company—"I feel that if your course had come to me thirty years earlier in my life it would have rendered productive at least ten years that were almost unproductive."

E. St. Elmo Lewis, advertising manager Burroughs Adding Machine Company—"Your course of instruction has enlisted the active enthusiasm of our people. It had proven right in theory and workable in practice."

Charles S. Howe, president Case School of Applied Science—"I think it would be an admirable thing for every engineering graduate to take the course which the Alexander Hamilton Institute offers."

Please tell the Advertiser you saw his Announcement in TELEPHONY.

Drive & Twist Anchors

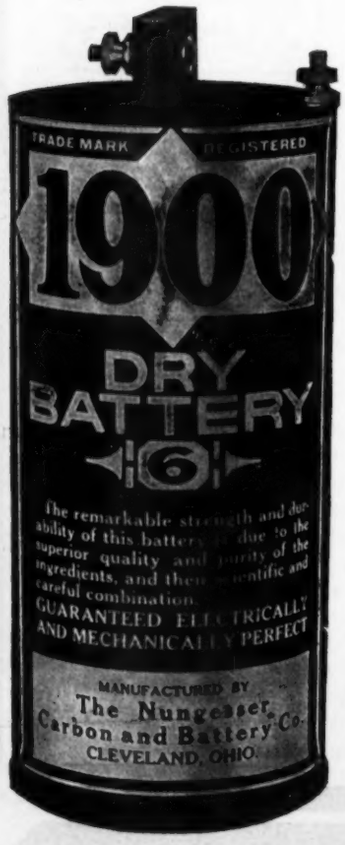
See our exhibit at the Telephone Convention, Chicago, Illinois, February 18th, 19th and 20th. Free literature and souvenirs for all. If you are a purchasing agent or superintendent for any Independent Telephone Company you are entitled to a miniature anchor. If you cannot come to the convention send in your name and address on a post card and we will send you one.

The Drive & Twist Anchor

is installed without digging of holes, only one minute of one man's time is required for installation. Various sizes for various strains. Holding power up to 15,000 lbs. Every D & T will save you at least 50c.

The Vote Berger Company

88 Railroad Avenue La Crosse, Wisconsin



TRADE MARK REGISTERED

1900

The Battery Which Made Good

Every time a telephone man goes to his jobber—and orders "1900" Batteries—he is buying batteries which have made good in service; which in the 20 years they have been on the market have demonstrated beyond all question or doubt their superiority. Back of the making of dry batteries is something more than mere materials; gray matter or "brains" *count*, with a knowledge or service conditions. The "1900" dry battery has always kept abreast of the times.

You telephone men, you gentlemen of the Convention, can make no mistake in ordering "1900" Batteries, they have made good wherever installed.

The Nungesser Carbon and Battery Co.
2500 King Ave.
Cleveland, O.

All Jobbers handle "1900" Batteries; they like to, because there is always a demand for "1900" Batteries

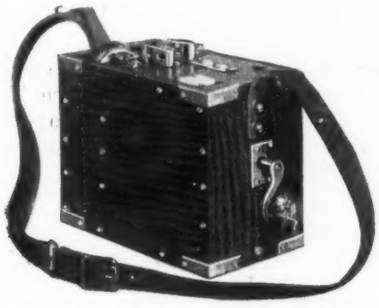
"1900" Batteries will be exhibited at Room 1720 at the National Telephone Convention

Please tell the Advertiser you saw his Announcement in TELEPHONY.

"and we feel very optimistic as to the future of Independent telephony, as also of the manufacturers who are catering especially to them. We believe that our company will break all records this year."

The Stewart Test Set.

A year ago at the convention of the National Independent Telephone Association, there was exhibited by Stewart Bros., of Ottawa, Ill., a new and improved lineman's testing set. Since that time the company has shown hundreds of progressive telephone companies its extreme high value as trouble finder, having sold each of them, it is said, one or more sets. To date the company declares it has yet to hear from a dissatisfied purchaser. The members of the firm have come in personal contact, at conventions and elsewhere with many satisfied purchasers, all of whom, it is stated, speak of the set in the highest terms and say they could not afford to be without it in the operation of their plants.



The Stewart Test Set Complete.

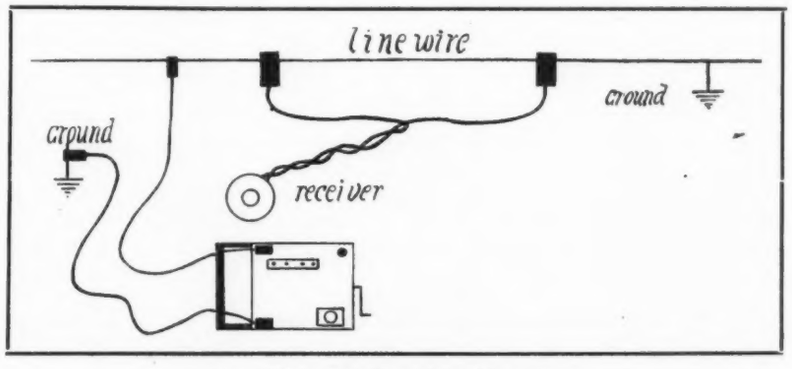
For those not already familiar with the points of the test set a brief description of it and its workings may be of advantage. The set is a very neat and well made portable telephone, to be used from the pole, or at any place along the line. It has a transmitter, receiver, induction coil and powerful generator, one that will ring through on a heavy loaded bridged line. Besides being a very handy portable telephone, it is a test set, having the invaluable features of telling which way and about how far trouble is from the tester without cutting a wire.

The manufacturers claim it is the only test instrument that will select the actual trouble on the line and not be thrown off by the existing load of bridging bells that are across the line. Or, in other words, 10 1,600-ohm bridging bells measure 160 ohms when measured with a voltmeter, ohmeter, or bridge, and to this instrument the same 10 bells measure nothing, but it will actually select the cross that causes the trouble.

The company has letters in its files which substantiate the statement that the set will save time and labor to the extent of saving enough to pay for itself in 60 days of summer weather when storms, lightning, etc., prevail. It will also get winter crosses, grounds and shorts. On some cases of toll line trouble, it is stated, the set will pay for itself on one trip, as in many cases of toll line trouble the lost circuit time that could have been saved would more than pay for the set.

The Stewart test set is declared to be the cheapest and most efficient instrument made for locating line troubles, having all of the features found in any other tester and many new features not found in any other.

Stewart Bros. want to make known that the testing set is in the field to stay. It is for sale by such firms as the Cracraft Leich Electric Co., the St. Paul Electric Co., and the Electrical Appliance Co. It may also be purchased direct from Stewart Bros., at Ottawa, Ill. The firm's demonstration room will be No. 1721, La Salle Hotel, during the National Independent telephone convention.



Connections for Locating Grounds.

Coast to Coast Telephoning.

San Francisco and New York will be in direct communication by long distance telephone before the end of the present year. This announcement was made recently in San Francisco by A. C. Kingsbury, vice-president in charge of long distance wires and publicity, of the American Telephone & Telegraph Co.

According to Mr. Kingsbury, the direct wire will cost nearly $2,000,000, and the toll will be about $18 a minute.

"It is our plan," he said, "to have one wire run by way of Cheyenne, west along the route of the old Central Pacific, and another one out of Salt Lake to San Francisco by way of Los Angeles, taking the route of the Salt Lake & San Pedro."

Engineering officers of the New York Telephone Co. have expressed grave doubt as to the practicability of telephonic communication between New York and San Francisco. Mr. Thayer, chief of the engineering branch of the company, said no details had been drawn up and that he himself was doubtful as to the success of such a scheme.

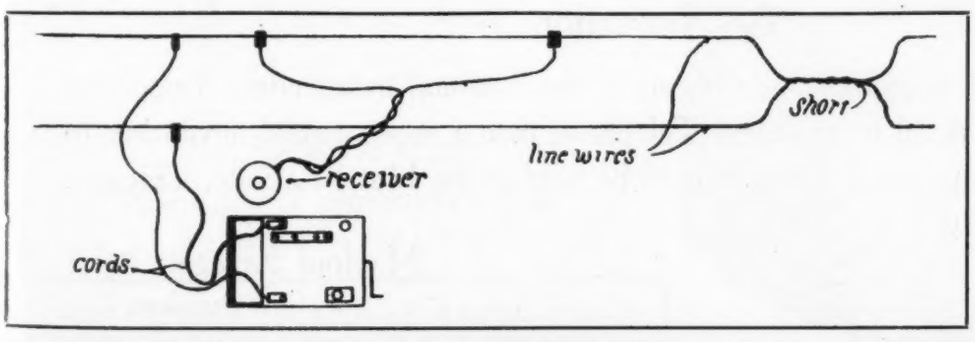


Diagram of Connections for Locating a Short with Stewart Test Set.

Installation and Protection of Rural Telephones.

Probably nothing is of more interest to operators of rural lines than methods of installing and properly protecting telephones. Very much depends upon the way in which this is done, both as to service and maintenance expense, as the modern telephone properly installed and protected will give very little, if any, trouble. This is often overlooked, however, and every company should adopt a standard of installation and

protection. In doing this it is urged that operators of rural lines will do well to investigate the Wirt plan, devised by the Metallic Lighting Arrester Co., Lewiston, Minn., which is said to embrace the most up-to-date and practical methods. The Wirt arrester, which is of metallic construction and well adapted for outside use, is installed well up on the corner of the house nearest the pole, thereby getting the shortest possible span between the pole and the house, and lessening the danger of the drop sagging low enough to interfere with traffic. Directly under the arrester a good ground is connected with no smaller wire than No. 12. Absolutely no crooks or turns are allowed in the ground wire. A heavy knob is placed about 4 ft. above the ground and to this the ground wire is securely tied, this tie being substantial enough to cause the ground wire to break between the knob and ground in case strain is brought upon it. The arrester forms a terminal or connecting block for the house wires, ground wire and duplex. The telephone is connected to the line through the arrester by No. 18 twisted pair, in which choke coils about 4 in. long (formed over a lead pencil) offer impedance to heavy discharges. The telephone then may be installed in any part of the house without danger of heavy discharges doing damage. The carbon arrester is usually on the telephone, but need have no connection with the ground, as discharges heavy enough to do damage are impeded by the choke coils and sent to ground through the metallic arrester. Telephones installed under the foregoing specifications, the company claims, will also be exempt from carbon trouble usually so common in rural line work.

The Wirt.

The company declares that there is every indication that the year 1913 will be a year of rebuilding and that of a very substantial nature.

Double-Phone Popularity Growing.

The Double-Phone Mfg. Co., Inc., Boston, Mass., has been in business for a year and a half, during which time it has been perfecting the instrument called the Double-Phone. The purpose of this appliance is to double the hearing capacity over the telephone, or enable two persons to receive the same message at one time. It shuts off all outside noises, the manufacturers claim, eliminates complaints of poor telephone service. It is also helpful for people of impaired hearing. The instrument has passed the experimental stage and is guaranteed to do as represented. The company is now ready to place it regularly on the market and to supply any demand.

During the past year and a half a number have been sold to telephone companies, railroad companies, supply houses, the U. S. Navy, and many other concerns and individuals. The sales are fast increasing, each week showing gains over any previous week.

The Double-Phone is declared to be a good will producer for telephone companies who use it, being simple and practical, with nothing to get out of order or break. It may be used in every office, factory and home.

An extensive advertising campaign is now being arranged by the Double-Phone Mfg. Co. for the current year. Inquiry is desired from all classes of business houses, as well as individuals, who might be interested in the sale of the Double-Phone.

ATTACHED IN ONE SECOND—
SLIPS RIGHT OVER THE RECEIVER.
TWO PERSONS EASILY CAN TAKE A MESSAGE AT ONE TIME
BOILER FACTORY NOISE COULD NOT PREVENT THIS MAN FROM UNDERSTANDING EVERY WORD DISTINCTLY

The Double-Phone and its Practical Applications.

Chicago Operators Present Opera.

One hundred girls from the Chicago Telephone Company's switchboards presented last week a musical comedy written a young woman employe of the company. Only one man participated—W. E. G. Pierce, in the commercial department. He is considered "safe" by reason of his almost 60 years.

The comedy was written by Miss Mary Casey, chief clerk of the traffic department. It is called "Just Bits of Fun," and is interspersed with a number of recent popular songs.

Buys Coast Telephone Bond Issue.

The Harris Trust & Savings Bank, of Chicago, has purchased the $7,080,000 Home Long Distance Telephone Co 30-year first mortgage 5 per cent. bonds due January 15, 1932, guaranteed by the Pacific Telephone & Telegraph Co. This is the company organized by the Pacific Bell to take over the Bay Cities Home at San Francisco.

An Invitation

The Board of Directors and Officers of the National Independent Telephone Association extend to all Independent Telephone men a most cordial invitation to to attend the coming annual convention to be held at the Hotel LaSalle, Chicago, February 18, 19, 20.

Manford Savage,
President.

SEE IT EXHIBITED IN ROOM 1751—
HOTEL LA SALLE, CHICAGO, AT CONVENTION

The *new* Gottschalk Transmitter

Make this one of the things you will see at the convention. Don't overlook it —entirely new and original.

Positively Waterproof, Sanitary and Indestructible. No flaring mouthpiece.

Expert tests prove its superiority for long distances. Transmits voice in natural clear tones. Can be submerged in water for days without damage to its transmission qualities.

No springs, fine wires or small parts. Mechanism entirely enclosed. No electrical changes in plant necessary. Minimum current consumption.

Eliminates maintenance cost.

Sanitary features self-evident.

In competitive territory, the company furnishing Gottschalk transmitters will secure the preference from any prospective subscriber and increase considerably the receipts of the pay stations.

Engineers are invited to investigate; if you cannot attend the convention, write for particulars.

Gottschalk Waterproof Sanitary Transmitter Co.

160 Broadway, New York City, N. Y.

SEE IT EXHIBITED IN ROOM 1751—
HOTEL LA SALLE, CHICAGO, DURING CONVENTION

What makes the CALCULAGRAPH *a necessity* for a telephone company?

An average of only two minutes lost per hour, in inaccurately recorded toll messages for twenty-four hours amounts to 17,520 minutes for a period of 365 days. If the low *approximate* average toll rate is put at 20 cents, the average revenue lost annually per company (not using the Calculagraph) would on this supposition amount to $3,504.

"Hit and Miss" Methods are in these days replaced by sure and dependable methods. The adding machine has of necessity replaced the old way of totalling columns—so the Calculagraph has been adopted and standardized as the most dependable time-measuring device for toll messages, by companies in every part of the world during the past fifteen years.

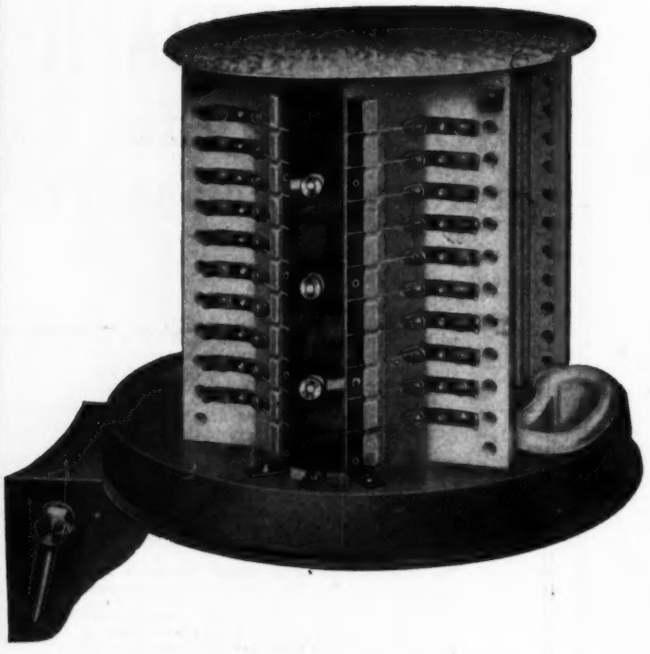
No other device is so simple, accurate and economical. The Calculagraph records Elapsed Time—the number of minutes a toll circuit is in use. This plan is fair and acceptable to both company and purchaser of its service. The Calculagraph *provides indisputable data for collecting pay for all excess minutes.*

Please let us give you some more information about the practicability of the Calculagraph.

THE CALCULAGRAPH COMPANY

1416 Jewelers' Bldg.,

New York City



"Royal" Protection

your cables are *safe*—and repair expense nihil when the

"HY-PO-STAT"

the all metal and porcelain cable protection is employed.

Write for information on the cable protector that "protects your cables" satisfactorily.

See our display at the National Convention

Royal Electric Co.
SIDNEY, OHIO

We Pay Your Repair Bills

Rather a startling statement, isn't it?

Let us tell you about it.

We have such positive knowledge that Chicago Telephones are trouble proof that we bind ourselves legally to pay all repair expense. We pay not only for materials required, but also for the time and expenses of your trouble man while he is going to and from the telephone, and while he is making the repair.

If the telephone is ten miles from your Exchange this expense item might be greater than the price of the telephone. We can afford to do this because the percentage of Chicago Telephones that ever need attention is negligible. During the year ending July 1, 1912, with six hundred thousand telephones in use, this trouble insurance cost us only $274.00.

No other telephone factory dares to duplicate this repair service because no other telephone is good enough to justify it.

Write for booklet entitled "Making Good."

Chicago Telephone Supply Co.
Makers of Telephones and Switchboards
Elkhart, Indiana, U.S.A.

GET HEMINGRAY GLASS INSULATORS

For Best Transmission

The teats on the petticoat, an exclusive feature of Hemingray Insulators, prevent water running to pins and causing grounds.

Hemingray Insulators are all insulation and are unusually free from breakage.

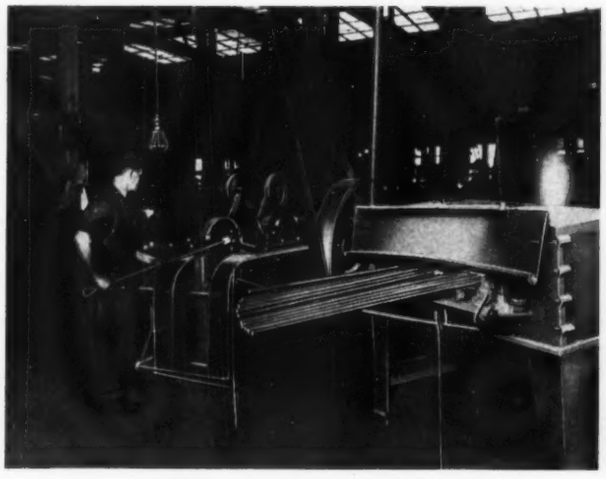
Write for Prices

Hemingray Glass Co.
Covington, Ky.

Factories: Muncie, Ind.

Evolution of the D. & T. Anchor.

An anvil, a sledge, a forge, a blacksmith and a helper—this equipment, under the shelter of a boarded shed, constituted the beginning of the Drive and Twist anchor of the Vote-Berger Co., La Crosse, Wis. After considerable experimental work, the D. & T. was manufactured in three standard sizes,



Forming the Cone Shaped Point.

which are adapted for use under all conditions and for any desired strain.

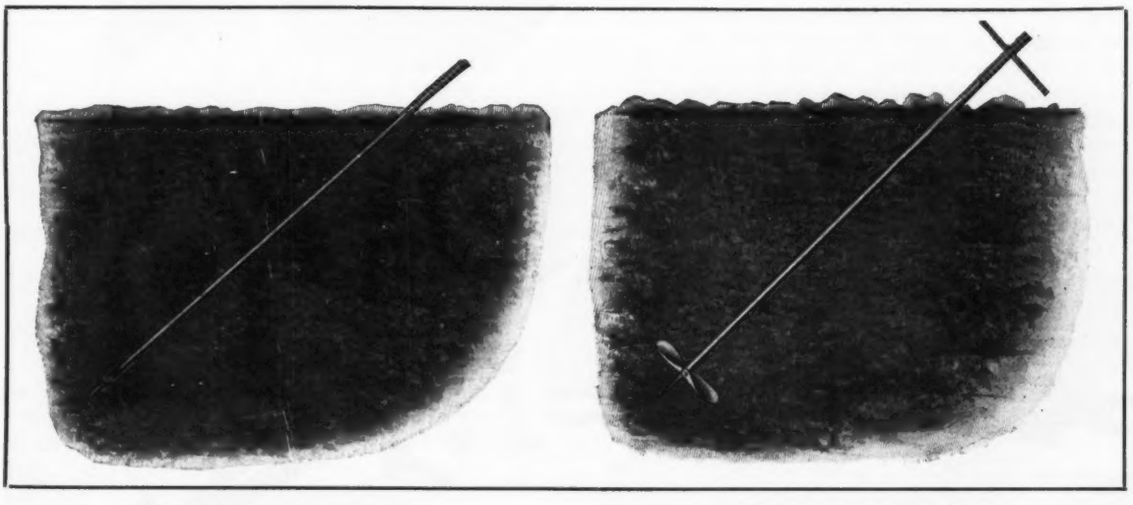
Early in 1905 steam hammer and forging hammer were added to the equipment and about 5,000 D. & T.'s were turned out and sold that year. Every year new equipment was added and the capacity of the plant increased. However, it soon became apparent that it would be more economical to manufacture some of the Drive and Twist anchors in Chicago, for distribution to the central and eastern states. This afforded a saving in freight charges on the raw material as well as giving D. & T. anchor users quicker delivery. In 1911 the Chicago plant, with a capacity of over 300,000 per year, began its manufacture of Drive and Twist anchors. The illustrations here shown are taken from actual photographs of the Chicago plant and show the system of handling the D. & T. which deliver a series of quick blows in place of a single heavy blow.

The rods are rolled to a size at the mills in Pittsburgh, where they are cut to length and shipped in large quantities. The first operation in their manufacture is the upsetting of one end in an upsetting machine, while the rod is red hot. It is then quickly passed to the next operator, who inserts the upset end into a pair of dies mounted in a Bradley hammer. By a series of quick blows, the ball is then drawn out into a cone, producing the finished point. The diameter of the shaft remains 3/4 in. or 7/8 in., depending upon the size of the anchor, but the cone is larger, having a diameter of 2 in. to 2 1/4 in. It is drawn to a sharp point and has smooth sides, so that it can be easily driven into the ground.

After the points cool the other end is heated. This end is formed into a common loop eye by means of a bending die mounted in an upsetting machine. After heating it once more, it is formed to shape and welded under a Bradley hammer. This forming operation gives the eye its peculiar triangular shape which enables it to withstand the severest blows of a sledge without collapsing. The sides of the eye being straight, the blows are directed into the shaft without tending to throw them either out or in.

Setting Blades in Place on Shank.

The rivet holes through which the blades are hinged to the rod are hot punched in a punch press. This operation at the same time enlarges the stock around the rivet hole, thereby reinforcing it. Next the rod is either treated with black asphaltum or is hot galvanized, when it is ready for the blades.



The D. & T. Driven in Place. Expanded, After Being Set.

The blades are blanked from flat steel and formed on punch presses at the rate of 12,000 finished blades per day. Next they are treated with asphaltum or are hot galvanized and are then hinged to the rod. The rivet which is used for this purpose is of ½-in. black diamond tool steel, which will hold a strain of over 20,000 lbs., however it is applied.

It will be noted that oil furnaces are used in place of the ordinary forge. This equipment affords a more even heat on the anchors and eliminates to a great extent the danger of burning the steel. While the La Crosse plant is equipped with steam hammers, the one at Chicago has Bradley hammers, which cuts manufacturing cost to the lowest minimum.

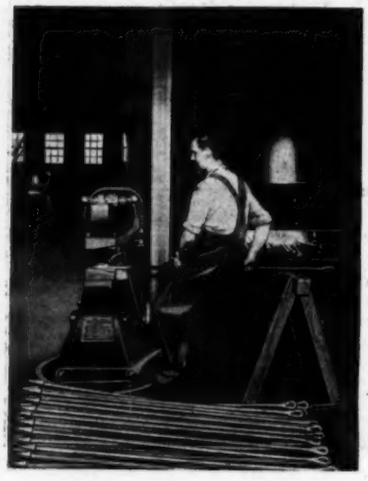
It will be noted that D. & T. anchors are comparatively expensive to manufacture. At the same time they are sold at a low price, necessitating the greatest economy in production. However, the finished D. & T. anchor is an example of extremely high workmanship and high grade materials. It is built

of steel throughout, no cast iron entering into its manufacture.

It is the policy of the Vote Berger Co., the manufacturers, to ship all D. & T. anchors the same day the orders are received, but, during the past four months both factories have been pushed to their limit, and in many cases it was impossible to make deliveries short of 10 days. However, manufacturing facilities have now been so increased that there should be no recurrence. The Vote Berger Co. also contemplates opening two other factories, one on the Pacific Coast and one in Canada. These will relieve the present plants of their overload and at the same time place the D. & T. closer to the market in their respective territories. The Drive and Twist anchor plants are always open to inspection, and the Vote Berger Co. considers it a favor to the company to show various stages of manufacture.

Johns-Manville Co. Opens Salt Lake City Office.

The demand in Salt Lake City, Utah, and vicinity, for J-M asbestos roofing, shingles, pipe coverings, stucco and other building materials, conduit, cold storage insulation, waterproofing materials; packings, plumbing specialties, lighting fixtures, electrical supplies, and other well-known products manufactured by the H. W. Johns-Manville Co., of New York, has increased to such an appreciable extent, that it has been found expedient to open a branch office in the Dooly Block, there.



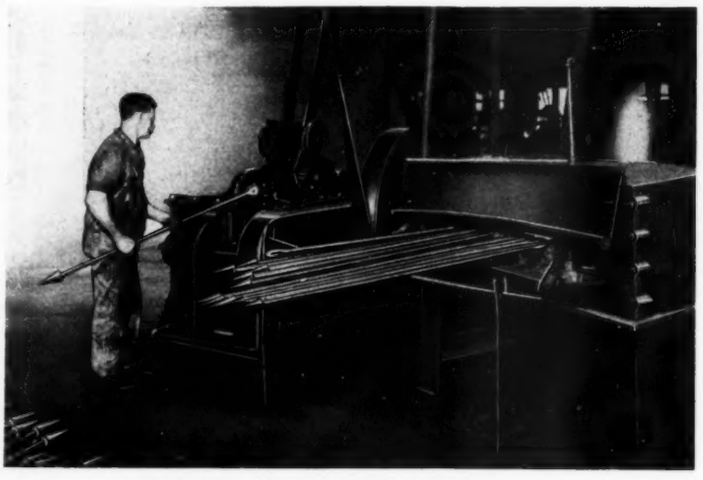
Punching the Rivet Hole.

The company's many customers in that section of the country will undoubtedly appreciate this as it should materially facilitate the handling of correspondence, orders, etc.

A Strong Line of Steel Specialties.

There is now just being introduced to the telephone field a strong line of steel specialties which should command the attention of every manager. The Barnes & Kobert Mfg. Co., New Haven, Conn., has assembled a wide variety of appliances, a few of which are here shown, which are said to have been developed as a result of thorough familiarity with the conditions under which they are used, and with an eye attentive always to the economy of both time and money.

It is said for the B. & K. Mushroom guy anchor that, when expanded, it has 375 sq. in. of surface exposed. It is urged that comparison be drawn between the hold which this anchor has when in place and that of other makes on the market. The B. & K. Anchor disc is made in sections, as shown in the illustration. By fitting the parts together, the area may be increased as desired, up to the full capacity of the expanding disc. Each additional section fitted in place also increases the thickness of the hub and the strength of the anchor as a whole. Being built in this shape, the anchors can be solidly packed, as indicated in the cut of the crated sections. The company declares that they are cheaper than "dead men" in the long run, and that the freight charges on them are very much

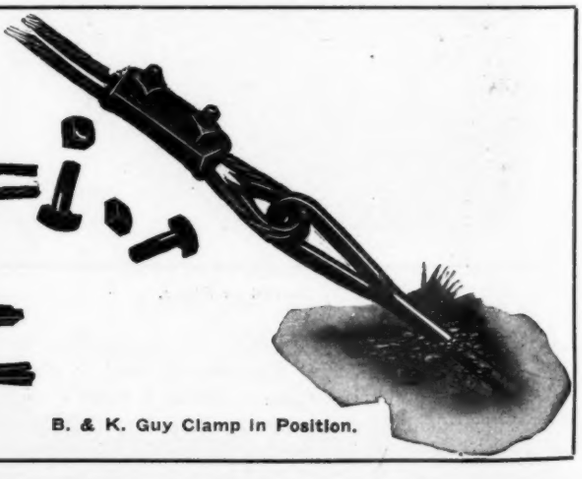


Making the Triangular Eye on the D. & T.

Anchor Expanded and in Crate.

The New B. & K. Wood Strain Insulator.

Wire Broke Under Strain—Clamp Unimpaired.



B. & K. Guy Clamp in Position.

less than on "dead men." The third drawing of the anchor shows all parts assembled and the anchor expanded to its full dimension.

Another specialty in the B. & K. line is the wood strain insulator. These insulators are made of second growth native hickory wood, impregnated with clear air-drying hickory varnish, or pure paraffin wax. The caps are each of one piece, of pressed steel, with reinforced heads and electrically welded eyes.

Blackburn's *Boltless* Pole Clamp

Blackburn's Messenger or Wire Splicer

Evidence of the strength of the B. & W. guy clamps is given in the illustration herewith showing how the one-piece clamp, under actual strain, held beyond the breaking point of the wire guy rope, the clamp itself being practically undamaged by the strain. The B. & K. guy clamp holds the rope in grooves between the T-bolt head and the clamp, so that no portion of the strand is injured. It is easily and quickly adjusted.

B. & K. Mushroom Guy Anchor Disassembled.

The Barnes & Kobert Mfg. Co. will be glad to answer all inquiries regarding its line, and to send literature and prices to telephone managers who are interested in saving money and securing efficiency at the same time. The various steel devices for use in line construction should appeal to them.

A Good Year for Everstick Anchor Co.

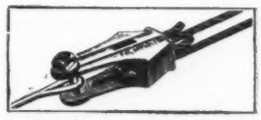
The Everstick Anchor Co., of St. Louis, closed a very successful year on December 31, last, the sales of anchors showing 25 per cent. higher than for 1911—and the latter was a big year for the company.

Jasper Blackburn, president of the Everstick Anchor Co., said to TELEPHONY'S representative, in answer to an inquiry regarding the business: "Our business has grown every year since we started, gaining from 25 per cent. to 300 per cent. per year. We feel that 1913 will show a decided increase over the year just closed. During 1912 we established a branch of our business in Los Angeles, Cal., with R. E. Blackburn in charge as manager. The branch is located at 316 Commercial street.

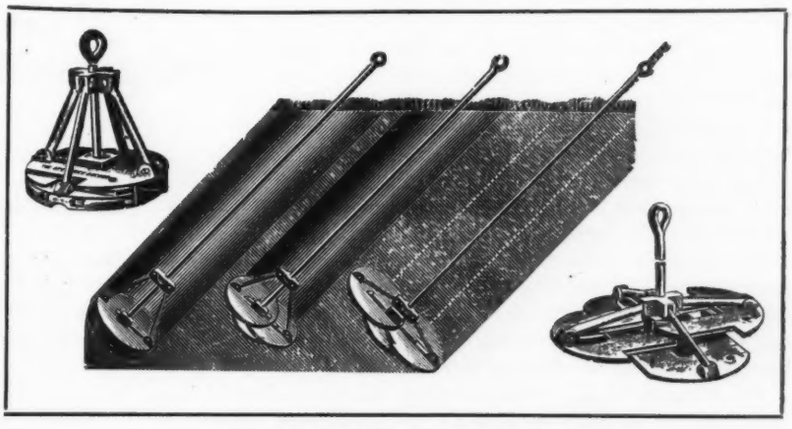
"Blackburn's Boltless Clamps are making a great hit," he continued. "Construction men of some of the largest companies predict that the tonnage of clamps sold will shortly exceed the tonnage of Everstick Anchors. We have already booked some nice orders for future delivery and many others are promised and in live prospect."

The claim is made for the Blackburn Boltless Clamp that it will do the work much better than any three-bolt, or any other kind of clamp, with a saving of time and material. The illustrations herewith show some of its applications. The Everstick Anchor is also shown, closed, expended and in position in the ground. The Everstick, the manufacturers declare, is the quickest anchor to install where the removal of earth is necessary to place an anchor. It is also stated that no anchor placed without the removal of earth can compare in holding strain with the Everstick. The new model can be installed at any depth in less than half a minute after the hole is bored. It is expanded, when once planted, by striking it with a tamping bar.

Blackburn's *Boltless* Guy Clamps



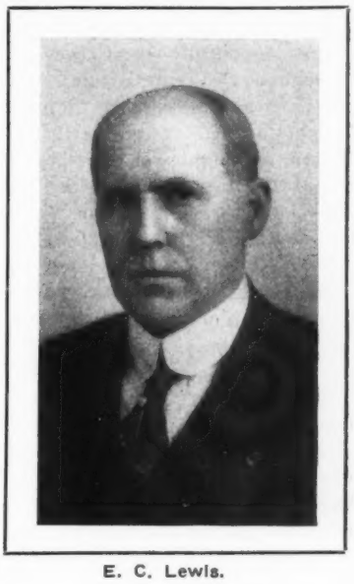
Blackburn's *Boltless* Twin Guy Clamp



How the Everstick Anchor Operates.

E. C. Lewis Now an Automanual Booster.

E. C. Lewis, whom many TELEPHONY readers will here recognize as an old friend, began his telephone career in 1893. After building several exchanges in Iowa, he was for several years connected with the construction departments of the Independent systems at St. Paul, Minneapolis, and Detroit. In 1902 he accepted a position with the Stromberg-Carlson Telephone Mfg. Co., traveling for a time in Ohio and afterwards being connected with the Chicago sales office. About the first of the year he became dissatisfied and even contemplated quitting the telephone game and going into the automobile business, or some other line which would afford opportunity for advancement. He therefore tendered his resignation January 2nd and severed his connection with the company after over 11 years' continuous service selling telephones and equipment.



E. C. Lewis.

Soon after leaving the Stromberg-Carlson company he received an attractive offer from the Telephone Improvement Co., Chicago, and, being of a conservative turn of mind, he determined to carefully investigate the claims for the Automanual system. He, therefore, spent over 10 days examining the North Electric Company's new factory at Galion, Ohio, and

inspecting Automanual exchanges at Ashtabula, Conneaut and Warren, Ohio, Greensburg, Ind., and Galesburg, Ill.

He found a well designed and spacious factory equipped with every modern appliance, and the managers of the various exchanges simply overflowing with praise for Automanual. He also talked with many subscribers, and in every case found they were highly pleased with the service. The greatest endorsement, however, came from managers of exchanges near those equipped with Automanual.

Mr. Lewis' investigation proved a revelation. Although he has been in the telephone business for 20 years he frankly admits that he knew very little about scientific telephone practice until he began to investigate the Automanual process. He is now firmly convinced that this is the only practical solution of the telephone question, especially in exchanges of 1,000 subscribers and over.

After February 15 he will be connected with the Telephone Improvement Co. and will be glad to receive his friends at the company's general office, in the Monadnock Block, Chicago.

"E. C.," as he is called by his intimate friends, is gifted with a pleasing personality and is an excellent entertainer. He is a good fellow in the most wholesome sense of the word. These are some of the reasons why he numbers among his friends practically every Independent telephone man located throughout the central states.

He is a considerable "joiner," being a member of the Knights of Pythias and the B. P. O. E.; a thirty-second degree Mason, a Knight Templar, and a life member of the Shrine. He is also a member of the Illinois Highway Improvement Association, the American Automobile Association and the Chicago Motor Club.

TELEPHONY is glad to learn that Mr. Lewis has decided to remain in the telephone business and joins his many friends in wishing him success in his new affiliation.

A Scientifically Made Lineman's Pliers.

Up to the present time it has been the custom of all tool manufacturers to follow and adhere to so-called standard designs and methods of shaping pliers. The regular bell-hangers plier as well as the standard side cutter that the lineman uses have been staple shapes for many years. But, it is alleged, tools of this kind have never been entirely satisfactory to the workman. One manufacturer will pull in the handles ¼ in.; another would spread them ¼ in., but the result was often the same, an uncomfortable, unreliable, and unsatisfactory grip. The plier handles would raise blisters on the palm of the hand. The handles in another case would be so close that, in cutting wires the knuckles would be pinched and bruised; in still another case, the shape of the handles would be such that full pressure could not be put on them.

Noting this universal defect, the Smith & Hemenway Co., of New York, manufacturers of "Red Devil" tools, undertook to build a plier on scientific principle, principles which differed so radically from the usual methods that the company states it was many months before it demonstrated to several experts that the only correct way to make a plier was on scientific lines, just the same as an architect draws plans for a 40-story tower building, or an engineer goes into the technical detail of the current carrying capacity of a piece of electrical copper with several bends or breaks in it. The result is an entirely new shaped handle, as shown in the illustration.

The company says: "Follow closely the lines of these handles, note the peculiar bend, note the narrowness toward the head. Note the swell in the middle and offset at the end. Look then at your hand as you would grip a tool of this kind in actual use. Does it conform? It does, scientifically, accurately, and comfortably. The feel of these scientifically shaped handles is just as satisfying as a well fitting glove. They afford no possible chance to pinch the knuckles or fingers; no possible way to raise blisters on the palm of the user's hand, no matter how constant the use of the tool may be. Moreover, it has been the usual custom to knurl or check the handles—an unsatisfactory method. In these scientifically made 'Red Devil' pliers, knurling or checking is eliminated entirely, and scientific principls are again employed by 'dentyne milling' them. This method gives to the handles a 'grip that will not slip,' a grip that is smooth, accurate and retaining, just as is found on a high grade rubber handled revolver or dental tool, a method so pleasing to the feel of the hand that without visual inspection it would not be discovered."

The Smith & Hemenway Co. states that all its plier of any size and nature are now being constructed on these scientific principles. Any tool or hardware store in the United States will show these new and well known electrical tools. There are over 1,700 kinds, styles, and sizes of pliers alone, as well as over 1,500 other tools and specialties that bear the "Red Devil" trademark.

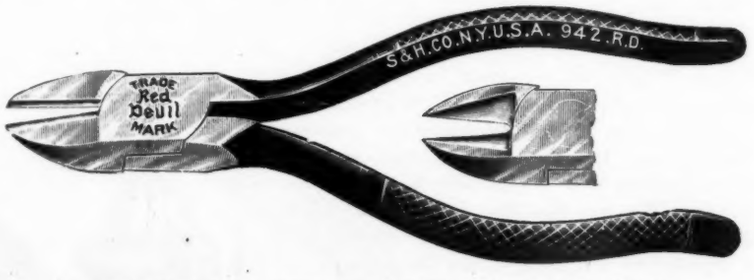
Paragraph.

R. S. MUELLER, of Cleveland, Ohio, dealer in electric wires and materials, announces that, effective February 1, he has secured the agency of the Anchor Webbing Co., of Woonsocket, R. I., for Ohio, eastern Indiana and eastern Michigan. The Anchor company manufactures a large line of linen tapes and sleevings used by the electrical industries.

Enforces Interconnection in California.

The California Public Service Commission has just rendered a decison providing that a physical connection must be established between telephone exchanges of unrelated companies in the northern part of the state. This case was brought upon complaint of the Tehama County Telephone Co. and the Glenn County Telephone Co., which alleged refusal of the Pacific Telephone & Telegraph Co. to afford the desired connection for long distance service.

The commission decides that public convenience requires that the physical connections be made. It finds that the expense of such connection should be borne by the Tehama County company and the Glenn County company. It states that the rates shall be the same as are now in force in long distance service. The commission finds further that the telephone companies should arrange for a just division among themselves of the rates, tolls, and charges. In case they are unable to reach an agreement on these points the commission will fix such division as it believes to be just. The companies are given twenty days from date to arrange for the joint service.



The New Shape "Red Devil" Pliers—They Fit the Hand.

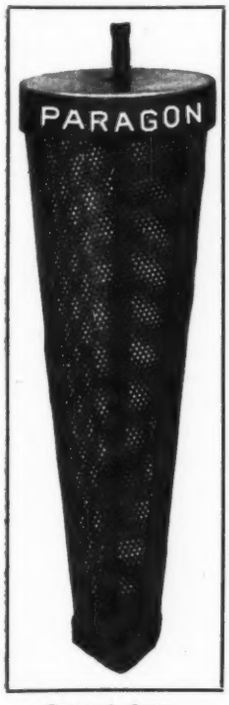
To Discuss High Tension Lines.

The Central Illinois Independent Telephone Association, recently organized, has called a special meeting to be held at Decatur, Ill., February 27, the purpose of which will be to discuss the new Central Illinois Public Utilities Co., which is building many miles of power transmission lines.

Hopeful Review from Paragon Sellers Co.

The following outline of the situation is given TELEPHONY by the Paragon-Sellers Co., Chicago:

"Our business for the past year has been the largest and best since the organization of the company. We have confined our efforts exclusively to a few high grade articles that have been proven by years of service and test to be the best in their respective fields. The trade all over the western hemisphere has come to regard the trademarks of the Paragon Sellers Co. as indicative of the highest quality.

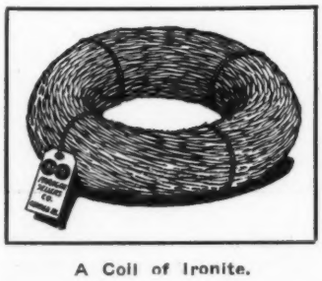


Ground Cone.

"Ironite, the ideal duplex drop wire, which has now been on the market for six or seven years, has been steadily increasing in use and favor and is standard with a great number of telephone and railroad companies all over the country. It is being used by the Canadian government telephone systems, United States government on the Canal Zone, where it was adopted after exhaustive tests; in Cuba, Porto Rico, Central and South America, Mexico, Hawaii, the Philippine Islands, and in a number of other localities where the atmospheric conditions are particularly severe. There are seven or eight instances of which we have record where it is being used with great success as a submarine circuit. This is remarkable as it is not made or guaranteed for any such service, but it only goes to prove our claim that Ironite is the best, most efficient, most economical drop wire on the market. It is as flexible as copper, has the tensile strength of steel, an extremely high insulation and its conductivity is ample for telephone purposes.

"Some of the most ardent admirers and largest users of Ironite are those who previously were prejudiced against it on account of the trouble they had experienced with ordinary rubber covered iron and the belief that all rubber covered iron wire was Ironite. After using Ironite a short time they quickly discovered the difference and now they tell us they believe Ironite to be the best drop wire on the market. The genuine always has our trade-marked tag attached. If this is not attached the wire is not Ironite. Ironite is made in the following gages and insulations:

No. 18 B.&S. (No. 19 B.W.G.) 7/64 in.
No. 16 B.&S. (No. 18 B.W.G.) 4/32 in.
No. 14 B.&S. (No. 16 B.W.G.) 5/32 in.
No. 12 B.&S. (No. 14 B.W.G.) 11/64 in.


A Coil of Ironite.

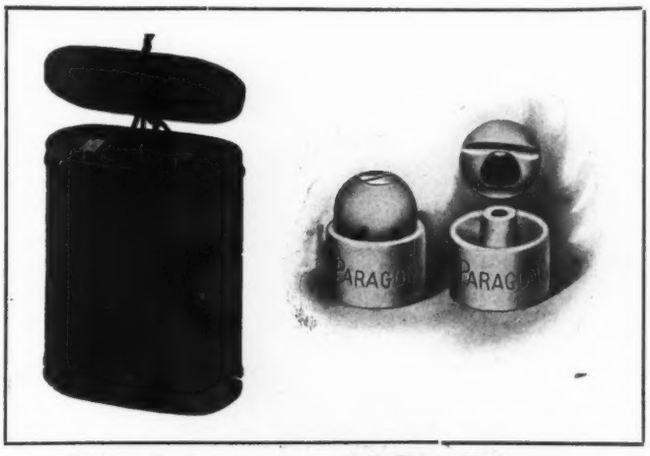
"The sales of the Paragon ground cone to customers of long standing, as well as the new business developed the past year has demonstrated to us the favor in which this meritorious device is held by the telephone and railroad trade all over the country. It is now, and has been for some time, a standard ground with some of the largest telephone companies in the United States and Canada and we ship large numbers of them for export continually. The Canadian government telephones have used them for years. The United States government on the Canal Zone and the Signal Corps and Forestry Service find them to be the most economical efficient device on the market. Engineers have realized that it was useless to install expensive lightning arresters and depend on a ground rod, plate or any such primitive and inefficient means of grounding. They have realized that a chain is no stronger than its weakest link and that the only way to make lightning arresters efficient was to back them up with Paragon cones. These are made in the following sizes:

"Telephone and Telegraph—No. 1, 1 ft., gage 25; No. 2, 2 ft., gage 25.

"Electric Light—No. 3, 1 ft., gage 21; No. 4, 1 ft., gage 21.

"Our business on the Paragon self tying knob has been steadily increasing and we look for a particularly good year for this clever device. It is the only self tying knob on the market and makes a particularly neat, efficient and inexpensive means of fastening the drop to the house or pole. It absolutely eliminates all tying, slipping and cutting of insulation and cuts the cost of installation in half.

"The Paragon battery box is, of course, well known and appreciated by the companies who operate magneto systems. It is almost indispensable for desk sets, etc., where previously the dry cells were allowed to stand exposed to rough usage and dirt. Now the cells are placed in a Paragon battery box, which is made in two sizes of heavy metal with the enamel baked on and insulated on the inside with a fibre lining, accommodating either two or three No. 6 cells. This makes a neat


Battery Box. Self Tying Knob.

installation, protects the batteries thoroughly, and the cost is almost negligible.

"As western representatives of the Electrose Mfg. Co., we have had a very satisfactory business on composition shells and mouthpieces, particularly considering the fact that the factory has only been in normal shape for a few months. It is now well established in new and fireproof quarters, has probably the largest equipment of any composition factory in the world and is in shape to make prompt shipments. The quality of Electrose needs no comment. It has been the standard of the country for years and the most satisfied customers on our books are those who have used it the longest. The new sanitary mouthpiece is proving very popular and our sales on these have been very large and are increasing very rapidly. The factory has lately established new prices on this mouthpiece which are very attractive and we expect to double our sales the coming year. We are also in position to take care of the trade promptly on all types of high tension strain insulations. These are absolutely the best insulators made and have been proven so by the most exhaustive tests by the A. T. of E. E.

"As western representatives of Alfred F. Moore, our business on cords, switchboard wire, cable, etc., continues very satisfactory. Where quality is appreciated and wanted, Moore's goods always have been and always will be popular. We are in position to make prompt shipment and expect a nice increase in this line for the coming year.

"We feel that the splendid business with which we have been favored the past year is a fit commentary on our line as a whole. We thank the trade for their past favors and can assure them that the high quality of Paragon products will be always maintained and that, as we add new devices from time to time, they will always be worthy of consideration and in line with the high standard of our present products."

The Development of an Accounting System.

The special system of telephone accounting, which has been evolved by John W. Coffey, head of the Coffey System & Audit Co., of Indianapolis, and which is now in use by telephone companies practically from coast to coast, first took form several years ago.

Following quite an extensive railroad experience Mr. Coffey became auditor and assistant manager for an Independent telephone company. In July, 1904, he became auditor for the New Long Distance Telephone Co., with headquarters at Indianapolis. He later became its traffic manager and, in 1907, general auditor for both the New and Indianapolis telephone companies. In 1908 Mr. Coffey organized the Indiana toll clearing house, serving for some time as its secretary, treasurer and general manager. He resigned from the clearing house later to take up telephone accounting and auditing in his own name.

It was during his early experience in accounting that Mr. Coffey perceived the need of devising some system applicable

John W. Coffey.

to the smaller plants. He believed that some plan might easily be figured out whereby they might keep their accounts in a practical manner, without the necessity of employing a bookkeeper and going to much expense to install an accounting system. Acting on this belief, he worked out a method which met with instant appreciation. So great did the demand for it become that Mr. Coffey finally went carefully over the plan again and revised it so that it might be used by any company, whether large or small. Still the demand increased, as the merits of the system became known and knowledge of its existence spread, until Mr. Coffey finally resigned from his other business connections and devoted his entire time to telephone accounting and auditing.

Since then he has, of course, greatly improved the plan until now the Coffey System of Telephone Accounting, as installed by the Coffey System & Audit Co., is said to represent the "last word" in this particular field. It has been altered in such minor particulars as were necessary until it is sufficiently flexible to accord with the demands of existing state public service commissions, or those likely to be made upon it by any new commissions which may be established. It also meets fully all requirements of the accounting plan for telephone companies laid down last month by the Interstate Commerce Commission. Mr. Coffey himself is a recognized authority on his specialty and is frequently called upon to talk on telephone accounting before Independent telephone associations. His latest address of this nature was made during the annual convention of the Illinois Independent Telephone Association, at Peoria, a short time ago. This will be printed in an early issue of TELEPHONY.

Mr. Coffey was retained about a year ago by the Independent interests in Illinois to organize the Clearing House in that state, an organization which has since been successfully operating.

The Coffey System will be on exhibition at the La Salle Hotel, during the national convention next week, in Room 1727.

Automatic Electric's Showing for 1912.

The annual report of the Automatic Electric Co., of Chicago, for the year ended December 31, 1912, has just been made

BALANCE SHEET.
AS OF DECEMBER 31, 1912.

ASSETS.

Plant, equipment and patents owned, including Strowger Automatic Telephone Exchange foreign and domestic patent rights.			$5,502,511.47
Current Assets:			
Securities of other companies at marketable value	$ 641,301.25		
Inventory of material and supplies at factory cost	610,678.27		
Notes receivable	547,022.64		
Accounts receivable	442,370.60		
Advanced insurance	3,962.28		
Cash in banks and on hand	$278,466.44		
Less set aside to cover bond interest payable Jan. 1, 1913	26,250.00	252,216.44	2,497,551.48
Deferred Assets:			
Unissued capital stock	$ 640,800.00		
Strowger stock, 1½ shares	30.00		640,830.00

LIABILITIES.

Capital stock			$8,640,892.95
Bonds covering patents only, issued to acquire the properties of the Strowger Automatic Telephone Exchange—authorized	$1,000,000.00		$5,250,000.00
Less redeemed and cancelled	$125,000.00		
Less in treasury 34,300.00		159,300.00	840,700.00
Current Liabilities:			
Accounts payable	$ 65.105.50		
Notes payable	150,000.00		215,105.50
Partial payments on uncompleted contracts, upon which no profits have been credited	$ 227,972.70		
Less shipments on same	60,235.01		167,737.78
Deferred Liabilities:			
Accrued taxes	$ 15,403.85		
Escrow agreement	30,000.00		45,403.85
Surplus and Reserves:			
Patent depreciation reserve	$ 996,746.51		
Machinery and replacement reserve	122,359.83		
Surplus	1,002,839.48		2,121,945.82
			$8,640,892.95

public. The balance sheet shows total assets of $8,640,893, and a net surplus, at the close of the year, of $1,002,839. Patent depreciation reserve aggregated nearly a million, and machinery and replacement reserve, $122,359.

Gross profit for the year just closed was $855,999; general and selling expenses were $259,267. Sixty thousand dollars were added to the machinery and replacement reserve; bond interest of $54,338 was met; net profit, therefore, amounted to $482,393, or over 10 per cent. on the outstanding capital stock. The balance sheet and the condensed income account appear in full on this page and the next.

In his statement to the stockholders, Joseph Harris, president of the company, said:

"While the earnings for 1912 appear as slightly less than those of 1911, the difference is more apparent than real. It so happened that some of the large orders were placed by companies that were unable to complete their exchange buildings

Condensed Income Account. Ended December 31, 1912.	
Gross profit	$855,999.54
General and selling expenses	259,267.67
	$596,731.87
Machinery and replacement reserve	60,000.00
	$536,731.87
Bond interest	54,338.13
Net profit	$482,393.74

in time to receive their equipment when ready for shipment. It was, therefore, necessary to hold this equipment at the factory and, not being shipped, it was not taken into account as part of this year's business. Had this condition not arisen the profits would have shown a material increase over the preceding year. However, the net earnings are in excess of 10 per cent. on the outstanding capital stock.

From the large increase in our security account, an impression may prevail that we are taking securities in payment for our apparatus, which is not the case. The increase in this account is the stock received from the English company in part payment from the sale of our foreign rights, and is carried on our books at 95, while the last market quotation was about 150, showing a substantial profit not figured in the assets of your company.

During the past two or three years our business in the United States has not shown the activity we had a right to expect. This has been due to the peculiar conditions of the telephone business, which have gradually been adjusted, until now a generally healthy tone prevails. Many Independent companies are now in a strong position, and are desirous of rehabilitating their plants with automatic equipment; of this, several large contracts now in process of closing with your company give substantial evidence.

Automatic development in the foreign field is marked. As you are probably aware this company has entered into agreements, either on a royalty basis or through sale of its rights with strong companies in England, France, Germany, Australia, and in fact, all foreign territory. The English company, in which your company is largely interested, reports most satisfactory results. Two installations have already been made, and the equipment for Leeds, manufactured by your company, is now ready for shipment, and we are promised several large orders in the near future. In France, through the Thomson-Houston Co., we have received several orders and are now installing the first large exchange in the city of Nice, changing the entire system from manual to automatic.

In Germany, where the Siemens-Halske Co. is manufacturing under your company's patents, the development has been extensive. They report numerous installations throughout the empire, which shows clearly that a general change from its present telephones to automatic is being rapidly made.

The business in Australia was delayed somewhat owing to the very thorough and careful investigation that was made by representatives of the governments of Australia and of New Zealand. These engineers investigated the conditions both here and in Europe, made very thorough reports to their governments, and, unhesitatingly recommended automatic equipment. Several installations have already been made and contracts have just been closed for a part of Sydney. Your company has already furnished equipment for New Zealand, and is about to bid on several large installations for that country. The Canadian business has been most satisfactory. Practically all of the larger cities in the western provinces have installed your automatic equipment, and negotiations are now under way for further large installations.

As an illustration of the phenomenal growth of automatic service in foreign countries, I might state that less than three years ago we changed the equipment at Havana, Cuba, from 3,900 manual lines to automatics and they now have in operation about 12,000 telephones and have placed an order with us for 5,000 additional lines.

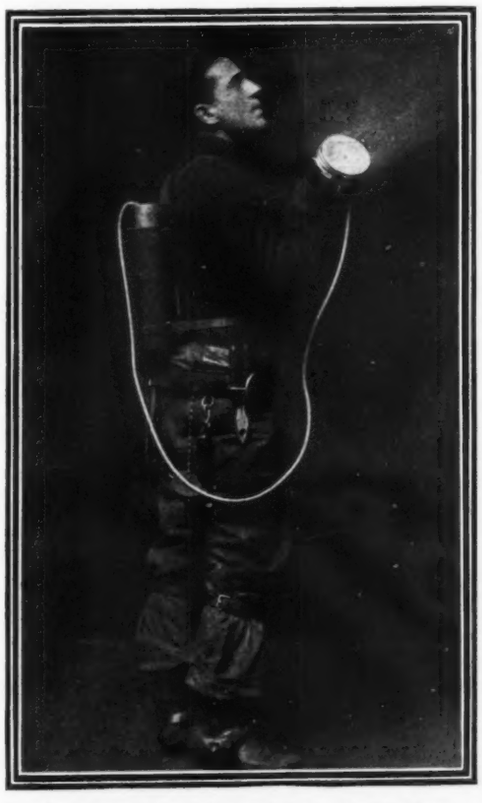
At the close of the fiscal year the company had on hand orders approximating one million dollars.

In conformity with its former practice your company has maintained, at large expense, an experimental department which has most successfully kept the company in the forefront of telephone manufacturers through new patents and improvements.

In concluding, I cannot too highly recommend the work of your officers and directors in the company's behalf. Their devotion to your business and loyalty to the enterprise have been the leading causes for the excellent results which the company now shows. Their work has been willing and efficient and makes it possible for me to state that the work of the past year, and the prospects for the coming year are the best in the history of your company."

An Efficient Night Aid for the Troubleman.

A portable searchlight for troublemen is being offered the trade by the Electric City Sales Co., of Marion, Ind. The good points of this apparatus may be readily understood by a glance at the accompanying illustration. The searchlight, the company states, was devised and developed to meet a real need of the trouble crews of telephone, telegraph, light and power and traction companies, who are called on to work at night, particularly in the vicinity of high tension wires. The apparatus weighs about 10 lbs., and is, as shown, carried by the operator by means of shoulder straps. It is said to give light enough to plainly distinguish objects at a distance of from 75 to 100 ft. The gas unit is of nickel-plated steel. A small gauge on the bottom indicates the quantity of gas contained in the reservoir at any time. To the holder is attached a specially treated, flexible tube, four feet long, connecting with a high reflector type of searchlight, equipped with two handles. One handle is on top, to facilitate ordinary carrying; the other is at the



The Troubleman's Portable Searchlight.

back of the light, enabling it to be readily turned in any desired direction.

The gas holder contains when fully charged sufficient gas to burn continuously for 65 hrs. It may be recharged, the company states, at any garage, at a cost of but 50 cents.

The Electric City Sales Co. says that these lights are now being extensively used by electric light and power companies and that they are of equal interest to telephone managers. The company will be glad to mail descriptive matter to any telephone company interested in an appliance of this character, and to quote prices singly or in lots.

The Paine Expansion Shell.

The Paine Co., of Chicago, has come into the telephone field with a new expansion shell of almost universal application. This shell is not made from any form of cast-metal, but is cut from sheets of steel, with dies that leave

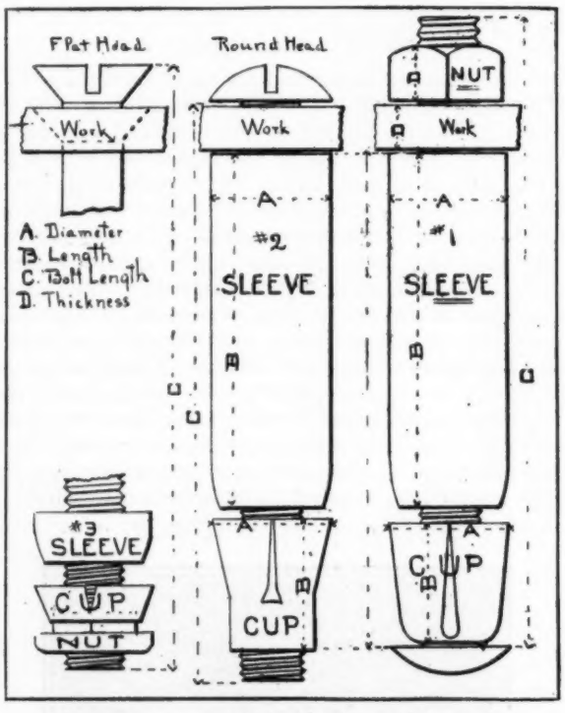


Fig. 1. Diagrams of Three Types of Paine Shell.

the lips of the expanding cups sharp and square. Unlike any other expansion device, it does not depend upon friction or strain for its staying qualities. The Paine expansion shell operates on the great mechanical principle of a truss, and thus acquires its name, the "Never-Give-Up," for it is claimed to be practically the only expansion shell in the world which will hold beyond the shearing strength of the bolt. It has a constantly increasing grip—the greater the strain the greater the biting hold. The cups tighten all around the hole with a perfect anchor, or fish-hook grip. The wall may come down or the floor up, but the Paine expansion shell will never let go, say the makers. No bottom is required to install this shell and, in fact, it is often used in place of a toggle bolt, the cup expanding out behind the material in the form of a truss.

Before placing this shell on the market the Paine Co. had it tested by several of the most prominent electrical and construction concerns in Chicago. The following letter, received by the company from one of these concerns, is said to be an average result of the tests:

"The bolts used were set in holes drilled in six months' old concrete; they were ½ in. carriage bolts, 3 in. long. They were set 4 in. apart and a U-shaped strap bolted down to make space to insert bar. A 20 lb. T rail being used, four structural iron workers—combined—tried to pull them out; the rail was bent several times, the bolts held firm. We took off the U-shaped strap, and tried to pull out the bolts with a railroad-spike clawbar. The bolts held firm. We then took a 3 in. x 3 in. x ½ in. angle iron and put a chain-fall on end of it, about 4 ft. away. The bolts still held firm and are in place at this time."

This is only one of several tests made, the company says, proving conclusively that it is literally impossible to pull the Paine expansion shell out of the hole before the bolt or screw breaks.

In addition to its superior holding qualities the Paine Expansion Shell may be installed with one hand in a third the usual time. This is a very important feature in telephone work, as "time saved is money earned." The directions given for installing the shells are very simple. Simply drop the shell and bolt (head down) into the hole, attach the work (or article to be held in place) and tighten up the nut. Or else, attach the shell to the work, insert the shell into the hole and tighten up the nut or screw. There is no hammering, no delay, no trouble, Paine Expansion Shells will often pay for themselves, the company states, in time saved. And, once in place, they will hold beyond the shearing strength of the bolt.

Anyone who has ever done any overhead work on high walls and ceilings, it is urged, will appreciate the great advantage of attaching an expansion shell to the work before inserting the shell in the hole. Paine Expansion Shells can be attached directly to the work before it is put in place, and one turn of the screwdriver, or wrench, accomplishes the desired result. The grip is instantaneous.

The Paine Expansion Shell is made in three distinct types, illustrated in Fig. 1. The No. 1 type is for heavy strain and general work where a finished surface is not required. The No. 2 type is designed for work where a neat finish is desired. It is particularly adapted for switchboard work, for attaching telephone equipment or wire moulding, and for all general inside installation. An exclusive feature of this type of shell, and a very important one in telephone work, is that it will not split or injure marble, slate, or tile. The No. 3 type is designed for special work where the holding is extremely shallow.

Fig. 2 shows clearly the action of the No. 1 type, "A" showing the sleeve, cup and bolt, assembled in the hole before expansion; "B" showing a cut-away section, with two cups slightly expanded; "C" showing the shell with three cups ready to be expanded, each cup biting independently all around the hole.

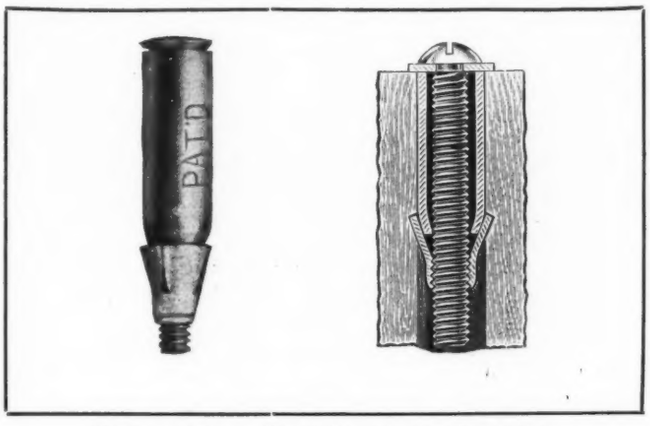
Fig. 3 shows the normal No. 2 shell assembled before expansion. Fig. 4 shows the same shell expanded in the material with one cup, and demonstrates the action of the No. 2 type. The tapered sleeve, it is explained, expands the cup into, rather than against, the walls of the hole,

Fig. 2. Various Views of the New Expansion Shell.

forming a perfect truss, with a grip fully equal to the screw used. Paine Expansion Shells are used with standard size screws and bolts, purchased anywhere, and no special tools are required to install them. Five extra cups are packed in each standard package of 100 shells to give

additional expansion in case of very soft material or extra large hole.

Interested telephone men, who write for further particulars, will receive a bit of wood in which will be fastened one No. 1 and one No. 2 bolts, ready for application. This, it is stated, will fully illustrate, not only the action of the Paine appliance, but the manner in which it may be fixed to the work before application.

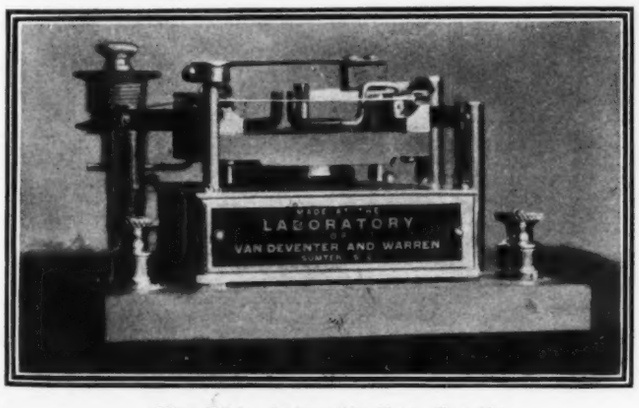


Figs. 3 and 4. No. 2 Normal and Expanded.

An Automatic Fuse Resetter.

Fuses are necessary to protect telephone and telegraph instruments from crosses where heavy currents are liable to come in on the line. But often the fuse is accidentally blown by lightning, which leaks past the lightning protector which should always be employed in connection with fuses. When this occurs the line remains open until some one puts in a new fuse. This condition is particularly annoying in the case of telegraph way-stations where the open fuse opens the entire line.

The condition was recognized by J. B. Elkin, of Columbia, S. C., a train dispatcher connected with the Southern Railroad, and accordingly Mr. Elkin has invented and patented an automatic fuse resetter as shown in the accompanying illustration. The device is quite simple, consisting of an ordinary clock spring with one gear wheel and an escapement. This drives a porcelain disk carrying a pair of fingers which grip the fuse wire that is fed into the machine from small spools containing enough for some 25 or 30 renewals.



The Elkin Automatic Fuse Resetter.

The apparatus is wound up like a clock and the line connected. When a fuse is blown, the mechanism is immediately set in operation. The disk is revolved, a length of fuse wire is drawn off the spool and automatically inserted in the line circuit, which consequently does not remain open more than three seconds. Of course in case of a dead cross, the machine simply continues to set and the fuses are blown continuously until the clock mechanism runs down, when the line is left permanently open the same as it would be if the ordinary type of fuse were employed.

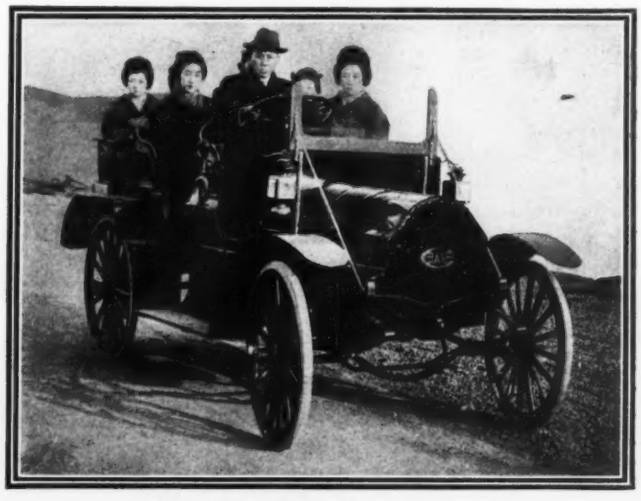
Unlike the ordinary cartridge fuse, this device is said to absolutely eliminate any arc due to the melted fuse lying on the bottom of the cartridge, as the pieces of blown fuses are thrown out of the circuit path by the action of the mechanism. The contact between the fuse and the mechanism is very strong and is said to be better than the contact usually existing in Postal type fuses.

The device will fill a long felt want for use in isolated stations where a regular troubleman is not on duty. It will operate some 14 to 16 times on one winding so that under ordinary conditions, it will not require any attention whatever except at four to six months' intervals. It will take any size fuse from one-half to five amperes and is therefore adapted to trunk line telegraph work. The fuse resetter will probably find its greatest use in telegraph way-stations which are closed at night, but which form links in a main line that is opened in case a fuse at a way-station is blown, due to a momentary cross or a slight lightning discharge.

The device is already being investigated by two large railroad systems with a view to its adoption on train dispatching wires which, of course, must be kept working under all conditions. It will probably be exhibited at the coming convention.

The Chase Motor in Japan.

The statement has been frequently made that Chase motors go everywhere. This picture, from Japan, the land of the orange blossoms, goes far to prove the truth of the contention. It was sent to the Chase Motor Truck Co., of Syracuse, by one of the company's dealers in Yokohama, and shows a truck equipped with seats, loaded with geisha girls. The original photograph was taken on the seashore near Yokohama, and the reproduction was made from an enlargement of the kodak snap shot, which decorated a post card.



Geisha Girls Joy-Ride in a Chase.

If Chase motor trucks are sufficiently worthy to interest the shrewd Oriental, it behooves the up-to-the-minute American to look into the matter. The company specializes in trucks for telephone work and will be glad to quote prices and send full descriptions to interested managers. Many telephone companies are now using the Chase, but there is always a chance for expansion.

Adjust Rates Following Complaint.

Complaint having been made to the Wisconsin Railroad Commission concerning telephone rates of the Oakfield, Wis., company, the directors of the company have readjusted them.

Magneto Board Especially Adapted for Small Exchanges.

Monarch Factory Rushed with Work.

The past year is reported to have been one of progress for the Monarch Telephone Manufacturing Co., of Fort Dodge, Iowa. An officer of the company states that the Fort Dodge factory has had all it could possibly do to take care of the business secured. After the move from Chicago, which was completed in January, 1912, the spring rush of business came on so rapidly that it was necessary to operate the factory both night and day for a number of months. By this means patrons of the Monarch company were kept supplied with equipment, notwithstanding the delays the factory experienced in connection with moving and getting settled.

Immediately after the spring rush was over the steady business throughout the remainder of the year kept the factory active at all times, and by working it full capacity constantly, the Monarch company has prepared itself to take care of the 1913 business in even better shape than in any year preceding. The prospects for orders and general activity among the Independent telephone buyers indicated that an extremely busy year would be experienced in 1913, and stock has been prepared to meet the demands for Monarch apparatus. The result is that the Fort Dodge company is now in a position to handle its increasing business and take care of both telephone and switchboard orders without delay.

The healthy condition in the telephone operating field is reflected in the business secured by the manufacturers. Companies which have been getting along as best they could with old, out-of-date switchboards are now replacing or planning to replace these equipments. The Monarch company reports great activity in switchboard work. A noticeable feature in connection with the buying of new switchboards is the fact that the operating companies know their own requirements better than they did a few years ago, and are demanding the latest improvements and the best apparatus that can be procured.

A type of switchboard which the Monarch company has found greatly in demand among the smaller magneto exchanges is shown in the accompanying illustration. This desk type cabinet is particularly well adapted to a small exchange as the large amount of desk room and the pigeon holes provide for the handling of such clerical work as is usually demanded of an operator in such an exchange. The desk is low so that any ordinary chair may be used. There is sufficient space on each side of the key and plug shelves for writing toll tickets and handling other record work.

Monarch Board at Webb City, Mo.—One of Largest Magneto Exchanges in the Country.

The reach to any jack is very short, so the operation of a board of this type is rapid and easy. Dozens of telephone exchanges have installed Monarch boards of this description during the past year.

The work of the Monarch company in equipping magneto exchanges has not been confined to the smaller plants. One company purchased two Monarch magneto equipments for its two principal exchanges. In one a five-section board was installed while a four-section equipment took care of the service in the other plant. A sufficient number of 500- and 600-line magneto boards were ordered during the year to keep the switchboard department of the Monarch busy at all times.

Monarch magneto multiple switchboards, it is claimed, have been always considered practically perfect for the magneto exchange which has outgrown its old transfer board. During the past year additions were made to the Monarch board installed in Webb City, Mo., an illustra-

Monarch Steel Wall Set—Open and Closed.

tion of which will be found with this article. This Webb City plant is one of the largest magneto exchanges in the country and, after having been in service for several years, shows that its cost of operation is very much lower than the average, as based upon figures from exchanges of similar size. In addition to supplying additions to this board the Monarch company has built and installed several new magneto multiple equipments.

The position of the telephone operating companies in regard to the purchase of new telephones is similar to the position taken in reference to switchboards. Telephone instruments of inferior makes, which were purchased at a time when first cost seemed to be the main consideration, are being taken out of service and replaced with the up-to-date and efficient apparatus manufactured today. Customers who have reported to the Monarch company that their territories are practically "saturated" are ordering telephones in considerable quantities. There seems always to be room and demand for a few more telephones, and there is always economy in replacing the worn out instruments with new ones. The operating companies have found out that the first cost is of comparatively little importance as compared to the cost of maintenance. Monarch apparatus, the manufacturers say, has always been made with the idea of reducing the maintenance costs.

A telephone order of considerable interest to the users of Monarch common battery instruments who have already become familiar with the satisfactory service secured from these sets, is a contract now being completed covering 2,500 instruments. Most of the telephones covered by this contract are the Monarch residence type steel box sets, as shown in the accompanying illustrations. This steel box is large enough to accommodate all of the parts, and yet it is small enough to strongly appeal to the residence subscriber. The Monarch idea of making all parts accessible is fully carried out in this telephone. The ringer is mounted vertically so the gongs are on top and a straight striker rod is used. The transmitter is mounted on a knuckle joint or fastened to the front of the case. The coil and condenser are mounted on a removable rack to which the line and receiver cord connections are made. All wires are left sufficiently long so that any part can be taken out and inspected readily. The condenser is held by clips so it can be removed with the connecting rack or separately. The front of the box, containing all of the parts and all of the wiring, is removable from the back. This feature is particularly advantageous in exchanges using harmonic selective ringing. If it becomes necessary to change the number of a subscriber, thus changing the type of ringer used, the wall of the residence need not be disfigured by removing the entire telephone. The front can be slipped off of the back and a new front or box with the required type of ringer installed in its place.

The work of developing and enlarging the products of the Monarch company has had attention and has progressed during the past year. A new desk stand has been designed and will be ready for sale about March 15. The new stand contains many of the desirable features of the old, but it is smaller and much lighter. There is declared to be no doubt but what it will strongly appeal to all users of desk sets, it being strongly made, light and pleasing in appearance.

The exhibit of Monarch equipment in Room 1713, La Salle Hotel, Chicago, during the telephone convention, should be of interest to everyone connected with the telephone business. The Monarch company wishes to extend an invitation to every telephone man attending the convention to visit this exhibit. Those who are unable to be at the convention can learn full particulars regarding Monarch equipment by writing for the latest advertising bulletins and by requesting that one of the Monarch salesmen call with samples.

A Method of Locating Opens Between Two Exchanges.

In order to make the location of opens easy, the writer uses a 3,200-ohm impedance coil bridged across a short toll line at the junction point of two sections. One section is owned and maintained by the local company and the other by a connecting company.

In the case of a broken wire, which seems to be the most frequent trouble on this line during the winter months, it was formerly necessary for each company to send out a man on the trouble, if service was to be quickly restored. Now it is an easy matter to determine in which section the open lies by measuring the resistance across the line by means of the volt-meter method and comparing the results with readings previously taken when the line was in good condition. Of course, if the line is open between the station making the test and the point at which the impedance coil is bridged, no reading at all can be obtained, providing there is no short circuit in that section of the line. The impedance coil, being of high resistance, does not seriously vitiate tests for the location of short circuits and crosses by the volt-meter method.

For the 3,200-ohm impedance coil, two 1,600-ohm ringers are used in series. These ringers have their armatures screwed down against their cores. Together with a lightning arrester of the self-cleaning type, they are mounted in a weather-tight box placed on a pole at the junction of the two sections. Two or three trips saved by this arrangement pay for the extra equipment used.

Ingersoll, Ont., Canada. Benj. Olney.

The Year with Ericsson.

"During the past year," said F. W. Pardee, vice-president and general manager of the Ericsson Mfg. Co., Buffalo, N. Y., to TELEPHONY's representative recently, "our aim has been to give better service to our customers. We already had the instruments and apparatus to satisfy the most exacting customers and, by adding nine distributing points to the 13 we had a year ago, we now have central points from which we can ship immediately to 22 sections of the United States and Canada. This gives us the best distribution of any Independent

The Ericsson Capsule Transmitter.

manufacturer in the country. We now have agents who carry a stock of telephones, etc., in the following cities: Cedar Rapids, Ia.; Kansas City, Mo.; Lincoln, Nebr.; Richmond, Va.; Nashville, Tenn.; Houston, Tex.; Louisville, Ky.; Indianapolis, Ind.; Grand Rapids, Mich.; Milwaukee, Wis.; Minneapolis, Minn.; San Francisco, Cal.; Portland, Ore.; Spokane, Wash.; Butte, Mont.; Buffalo, N. Y.; Pittsburgh, Pa.; Boston, Mass.; Atlanta, Ga.; Jacksonville, Fla.; New Orleans, La.; Toronto, Canada.

"Our agents also carry a full line of supplies, so that everything needed can be ordered in one shipment, thus effecting a saving to our customers in freight, cartage, postage and work. Besides the saving in freight gained by shipping from central points, we have made still further saving by packing telephones each in an individual corrugated cardboard carton, which gives the lightest packing case used by any manufacturer and one that is strong and stacks conveniently in the stock room. The steel telephones packed for shipment, batteries and all, weigh less than 25 pounds each.

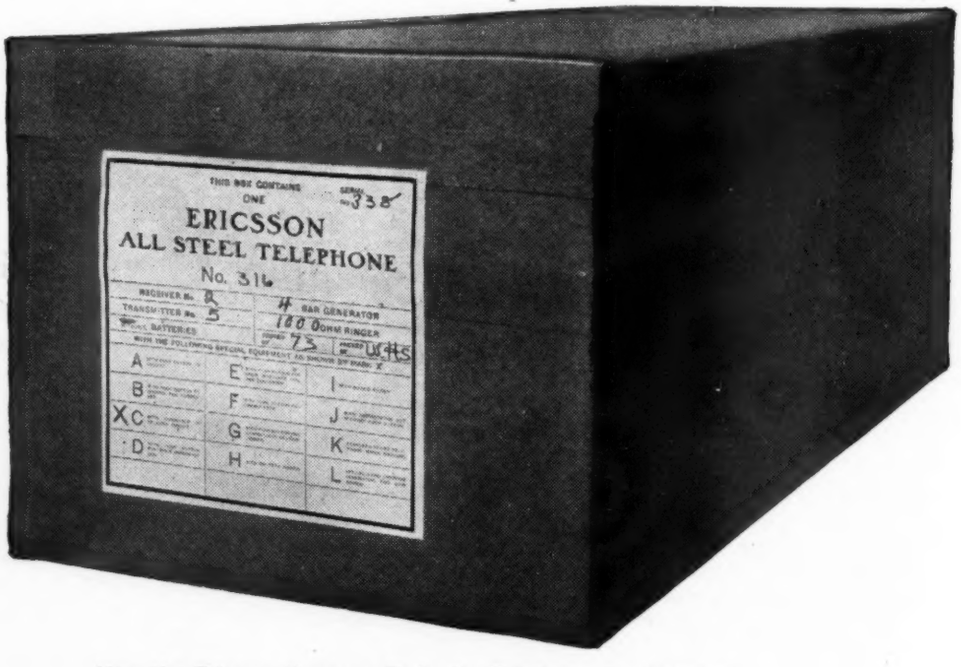
"The Home Telephone Co., of Los Angeles, Cal., found it necessary to replace all of its 14,000 transmitters and after a great deal of experimenting the company found that the cheapest and most satisfactory way to do this was to use the capsule of the Ericsson transmitter in the present transmitter shells. This method reduced the expense to a minimum and provided a very satisfactory transmitter at a very low cost. This was such a novel idea that TELEPHONY commented on it in one issue, which brought in inquiries from all over the country from telephone companies who were not satisfied with the service of their present transmitters. It was found that the idea could be carried out with any standard transmitter and so our business in transmitter capsules has been greater than ever before.

"Of course the popularity of the all-steel telephone and the Handmike has been on a steady increase, and a big business in the latter has come from one field that is rather unique. Some automatic operating companies found it very hard to use a large number of wall sets which they had in the stock rooms, because subscribers insisted on having desk sets. By taking off the receiver and transmitter from the wall set and substituting an Ericsson Handmike the subscribers were greatly pleased with the sets and therefore the companies were able to put into use all the wall sets which were being carried in the stock room. The old receivers and transmitters were used to equip new desk stands and a great saving was made, as well as moving 'dead' stock and putting it in use where it is earning something." It is, therefore, apparent that 1913 promises well for Ericsson.

All Steel Telephone.

The Lemke Battery Connector.

The original strip Lemke indestructible battery connector has found, according to the manufacturers, a largely increased sale during the year just closed. This battery connector was originated by the Lemke Electric Co., of Milwaukee, Wis., in 1908, since which time the demand for it has been growing. It is claimed to be the only connector of this style in the market. The Lemke is pressed from pure copper and annealed by a special process, making



How the Ericsson Company Packs Its Telephones for Shipment.

it pliable and tough. It is practically indestructible. The illustrations show two styles, closed and slotted end. The

Lemke Indestructible Battery Connectors.

Lemke Electric Co. will be glad to quote prices on these connectors upon application.

The Phillips Spring Hammer.

Every now and then there is placed on the market a new device, which accomplishes certain things far better than anything else has done up to that time and which possesses decided advantages over existing tools or equipment.

Among these, it is declared, the Phillips Spring Hammer may properly be placed. The hammer, which is a hand operated tool, is especially designed for drilling holes in concrete, brick or stone. It is adapted to a wide range of trades. The tool is so constructed that, by turning the crank, a spring actuated hammer is driven against the base of a drill at a velocity which accomplishes 10 or 12 blows in the space of time ordinarily consumed by the workman in striking one blow with a hand hammer.

It may readily be seen, too, that with it hammer work may be done in positions where the old methods would be extremely difficult, if not impossible to employ.

Fig. 3 clearly shows the manner of construction of the Phillips's hammer and also indicates the simplicity of its design. It is sufficiently small to be carried in the bag with other tools. It is always ready for service, requiring neither motor nor electrical connections, nor the use of compressed air.

The drill action is effected through the medium of a plunger sliding in a cylinder. The upper portion of the plunger is slotted and the ratchet in the end of the slot forces the plunger against the spring. The plunger and spring are always under pressure, and the drill receives the full thrust or blow from the tension of the powerful spring. The latter may be regulated to alter the force of the blow through the medium of a thumb-screw which is set in the handle of the tool.

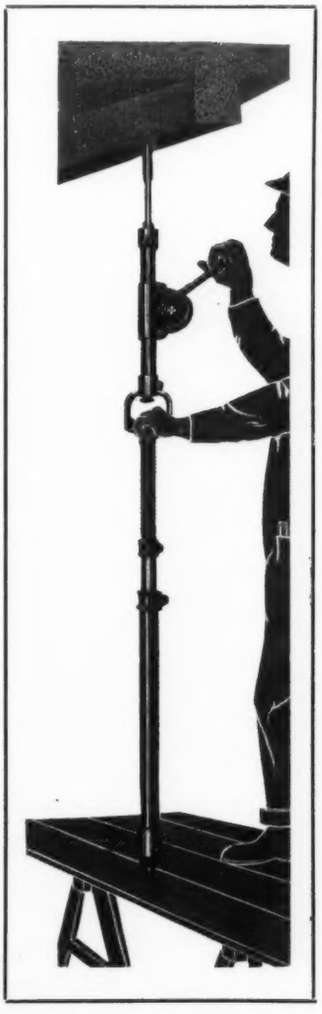


Fig. 1. Overhead Use.

It is urged by the manufacturer that the Phillips Spring Hammer is beyond all question one of the most valuable tools which the telephone installer may possess. With it, holes may be rapidly drilled in concrete, brick or stone for the insertion of expansion bolts, wires, etc., with a minimum of labor, and avoiding the use, either of primitive methods of hand drilling or of complicated equipment.

Fig. 2 shows some of the drills which have been specially adapted for use in the spring hammer. These are forged from high grade tool steel. The star drill is furnished with extra long flutes, affording a free passage for the cuttings and preventing the drill from choking or hanging in the hole. The hollow drill accomplishes the same end even more readily, the opening shown allowing the cuttings to drop out without clogging.

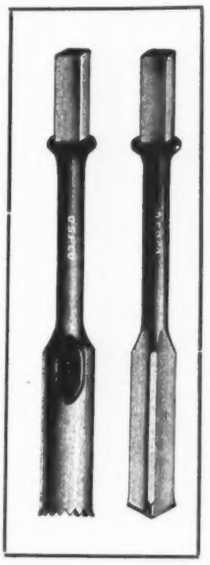


Fig. 2. Drills.

The hammer may be used with a breast plate if desired. Another special adjustment is shown in Fig. 1, which pictures an attachment for use in overhead drilling. This extension is made of three pieces of steel tubing, which, when connected with the hammer, give the right length for ordinary scaffold work. It has a two-foot telescopic adjustment lengthwise.

For ordinary drilling, without the extension, the operation is as follows: The spring in the hammer is set on its lowest tension, which is found by turning the thumb screw in the handle to the right until it stops. The drill is placed in the socket, the handle of the hammer held in the left hand and the crank turned with the right. A few blows are struck slowly, until the hole is properly started. After each blow, the drill is turned a little to present the cutting edges to a new surface. A heavier blow is obtained by turning the tension screw to the left. It is possible to strike the drill from 1,200 to 1,500 blows a minute. When going at a high speed, the drill should be turned at regular and frequent intervals in order that the bore may be uniform throughout.

In using the extension it is connected to the hammer as shown in cut and the drill placed in position. The spring is then compressed four or five inches and held in place by the tightening clamp. When the tool is set under the spot where the hole is desired, the length of the extension is adjusted so that the drill just touches the material to be drilled. The spring is then released, holding the hammer and drill to the work, the pressure automatically following up as the drill advances.

The Daugherty-Smith-Phillips Co., Chicago, which manufactures the Phillips Spring Hammer, states that some of the

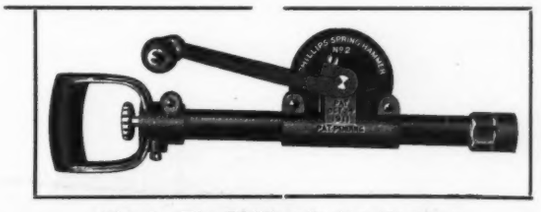


Fig. 3. The Phillips Spring Hammer.

hammers have been in service three years, and that they have fully demonstrated the claim made by the manufacturers that the Phillips hammer will drill 5 to 10 times faster than the old way of hand hammer and drill and will make a much more workmanlike job.

The company is prepared to supply to any inquirer printed matter, giving a full description of the manner and its attachments. The Phillips Spring Hammer is made in three sizes. The approximate weights, complete, range from 7 to 12 lbs. They are furnished with drills in a considerable variety of sizes, in 8, 18 and 24-inch lengths. Other sizes can be made to order upon request.

Oshkosh Company Records Big Increase.

"Our 1912 business showed a 27 per cent. increase in gross sales over 1911," writes the Oshkosh Mfg. Co., of Oshkosh, Wis., to TELEPHONY. "Practically all of the increase showed after June, as, owing to general unsettled business condi-

Straps cannot be lost or stolen.
Entire climber including spur forged from one piece of steel. Spur cannot loosen.
Long enough spur set just high enough to walk without dulling point.
See how the straps fit. The ring does it.

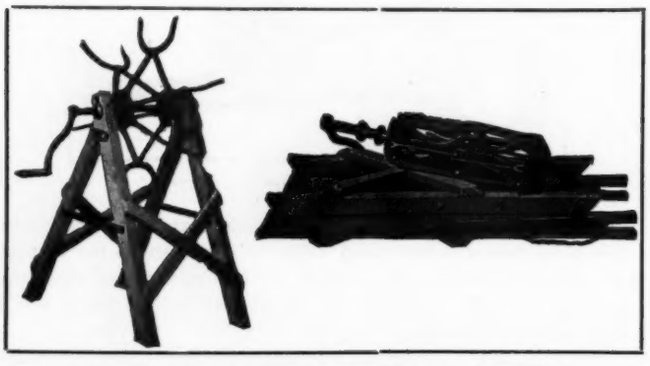
Some of the Good Points of the Roberts Climber.

tions previous to that time, our sales showed no particular increase for the first six months of the year. During the last half of the year, we had considerable trouble in securing steel and malleable iron deliveries promptly, but in spite of this strong steel market by going into the open market and buying, we were enabled to make practically all of our deliveries in a prompt and satisfactory manner. It was gratifying to realize the fine manner in which the trade responded to our efforts after the period of depression.

"Our sales of patented articles, such as Roberts climbers and Safety Folding Take-Up Reels, have almost doubled in the past year, indicating the favor these articles are finding everywhere. Coupled with this has been a steadily increasing demand for our regular line of construction tools from both old and new customers.

The Oshkosh Pike Pole.

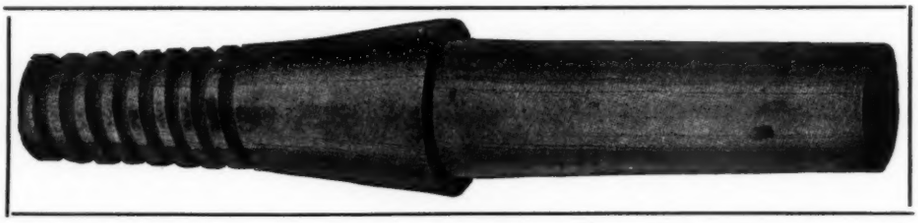
We attribute this increase to the fact that we are producing the finest grade of line construction tools on the market and, having the factory and organization to produce them in a most economical manner, are enabled to place them on the market at very reasonable prices.



Safety Folding Take-Up Reel—Open and Closed.

"We have completed contracts for agencies for our tools in several foreign countries and our sales in these markets have been very satisfactory. From advance reports we find the foreign trade very well satisfied with the goods, these reports being verified by constant orders from agents. Their one plea, however, seems to be for lower prices, even on small shipments. This matter will undoubtedly adjust itself, however, as the sales progress and the size of the orders increase. We shipped one large order for telephone construction work to Manchuria and have since heard that the tools are giving absolute satisfaction. On the whole, there seems to be a steadily increasing demand for American made tools in foreign countries.

"We anticipate a large increase of business for 1913 and are making preparations to care for it promptly. We are completing our contracts with the steel mills and malleable works for this year's needs and have just purchased 1,500,000 feet of maple, hickory, ash, Washington fir, etc., in logs which we will saw in our own mills, for use as tool handles. We purchase only high grade logs that will answer our requirements in every respect, thereby not having to take into consideration the expensive 'cull' proposition. We have succeeded in cutting factory costs, having a large field to work upon here, as we, ourselves, manufacture the tools from the steel and logs up, and these economies have enabled us to materially reduce our costs.



The Oshkosh Kalkeen Pin, Which is Said to Have Found Favor Generally.

"We are promised prompt deliveries of this material, which will enable us to fill all our orders in a prompt and satisfactory manner. As we buy in large quantities, we are able to secure raw material at the best prices, which fact, coupled with our No. 1 factory organization and large plant (making for economical operation), will enable us to make 1913 sales at practically the same rate as 1912, in spite of the rising lumber and steel market. This, we feel, will have considerable effect in increasing our gross 1913 sales. Summing the whole matter up, we look for 1913 to be the banner year of our existence, both as to gross and net."

A few of the Oshkosh company's particular "best sellers" are here shown. The Kalkeen pin, made in both telephone and telegraph sizes, is asserted to be rapidly increasing in favor. The company feels, in view of the fact that the locust pin is fast disappearing and that the price of it is increasing constantly, that all that this pin needs is some little exploitation to make it a winner. It is claimed to be 25 per cent. stronger than the locust pin and to actually outwear any wooden cross arm ever put up.

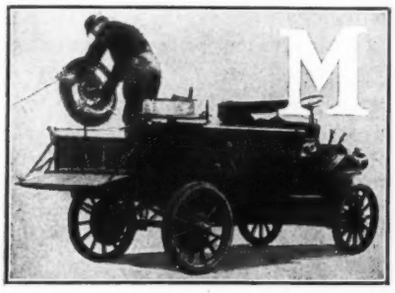
Another of the Oshkosh products is the Roberts climber, which the company believes is bound to supplant the old eastern climber. The shank and gaff of the Roberts are made of one piece of crucible steel (the gaff not being welded on—a big factor of safety). The patent ring, which allows the straps to hug both the instep and heel snugly, insures complete comfort.

These and many more of the Oshkosh Mfg. Company's products will be on exhibition in room 1735, of the La Salle Hotel, during the Convention next week.

Would Tax Pennsylvania Utilities.

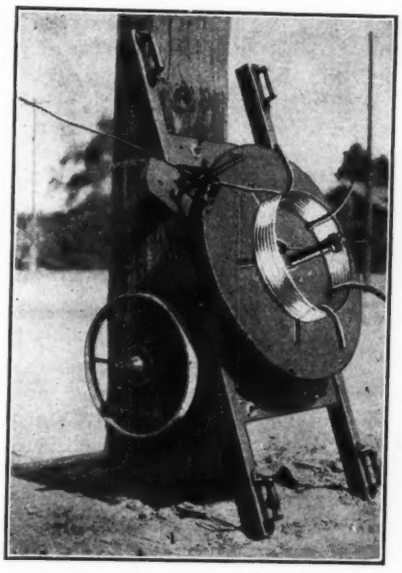
A bill presented in the Pennsylvania House by Mr. McClintock, of Philadelphia, provides for the taxation of all real and personal property of railroads, street railways and gas, electric, steam, telegraph and telephone companies, for county, city, borough or township purposes.

A New Combined Take-Up and Pay-Out Reel.



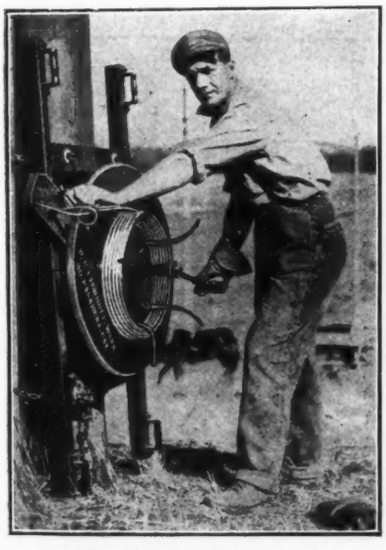
No. 104 Wagon Reel Mounted.

MATHIAS Klein & Sons, Chicago, have added a new specialty to their already extensive list, the Eichhoff combined take-up and pay-out wire reel, which will be on the market in time for spring construction work. This reel was designed to save time and labor in handling wire. It is claimed for it that it does the work of two reels, one to take up and the other to pay out, and that it does it better and in far less time. It is further asserted that, with the use of the Eichhoff reel, one man can do the work which, under former methods, required several.



No. 102 Reel Paying Out.

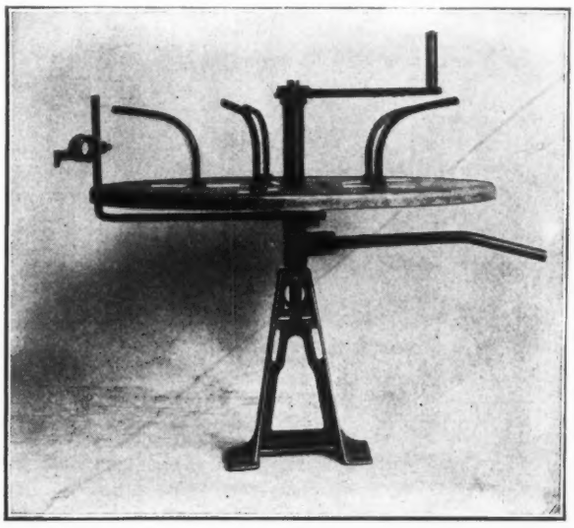
The reel disk proper, instead of being made of wood, is cut from 30-in. No. 12 sheet steel, and has a ¾-in. flange turned around the edge. The disk being smooth, there are no spokes or rim to cut through copper coating, or the insulation on wire. The No. 102 type of the reel is mounted on a carrying barrow without wheels, and can be used in a horizontal position, as ordinary reels are used, or it may be clamped perpendicularly to a tree, post or telephone pole. No matter how hilly or mountainous the country may be, therefore, this reel will adapt itself to conditions. The No. 108 has the barrow mounted on a pair of wheels, facilitating transportation.



One Man Does the Work.

Both reels have adjustable wire guides. One man can coil up from a quarter to a half mile of wire on an Eichhoff without assistance. It has a brake which can be set to operate at any tension, or to hold the reel absolutely immovable. The reel arms are adjustable permitting the removal from them of a coil of wire without difficulty.

No. 104 is a wagon reel. It has a special reversible T axle, permitting the reel to be placed in either a horizontal or perpendicular position, for either taking up or paying out wire. The T axle turns in the socket of the base so that wire may be taken up from any direction without turning the team or wagon. From four to six reels may be attached to the sides of an ordinary wagon bed, and from eight to ten may be mounted on a wagon rack. As they are bolted to the sides of the wagon bed, instead of across the end, the middle of the bed is left open, allowing more room for linemen's tools, etc.

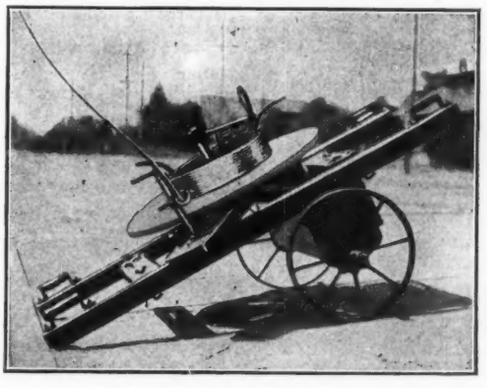


Detail View of No. 104 Wagon Reel.

The Wheels Carry the Weight.

The illustrations here shown give an excellent idea of the Eichhoff reel and the manner of its use. Mathias Klein & Sons will gladly mail full descriptive matter and price to any interested telephone managers.

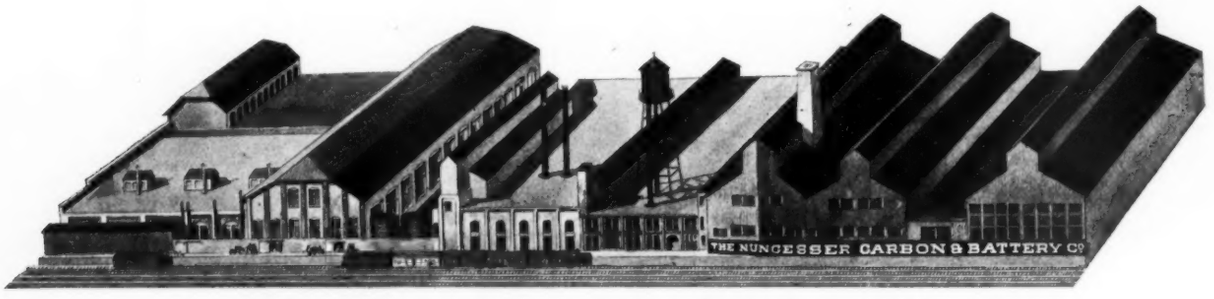
A resolution has been passed by the Nebraska House to memorialize the Nebraska members of Congress to introduce a resolution looking to government ownership of telephones and telegraphs.



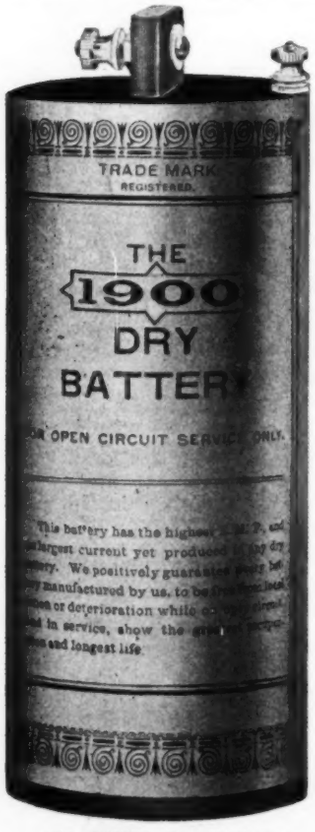
Paying Out from No. 108.

Nungesser Compelled to Enlarge Factory.

The Nungesser Carbon & Battery Co., of Cleveland, reports that, owing to a great increase in its battery business last year, it has been compelled to greatly enlarge its manufacturing facilities. This picture of the company's factory buildings will give some idea of the equipment needed to care for the big demand for "1900" dry batteries which it is kept busy trying to meet. The extension assures prompt filling of orders.



Factory Buildings of the Nungesser Carbon & Battery Co., at Cleveland, Ohio.



The "1900" Dry Battery.

The company sells its product to practically all the leading telephone manufacturers of the country, as well as a generous proportion of the operating companies, both large and small.

The Nungesser company claims four strong points of superiority in the "1900" dry battery. These are: Extra heavy zinc cans; imported Russian manganese ore, increasing the strength and uniformity of the current and preventing its strength falling away when flowing; round carbon electrodes, made in the company's own factory; and two heavy pulp board bottoms, instead of one. These four things, it is asserted, guarantee that "1900" dry batteries contain the largest amount of electrical energy possible in a dry cell. A trial order is solicited to demonstrate the truth of the claims made.

The company is convinced that if the "1900" dry battery is once used, a satisfied customer will have been made. This, it declares, is what past experience has proved. Write for full descriptive matter.

Talk.

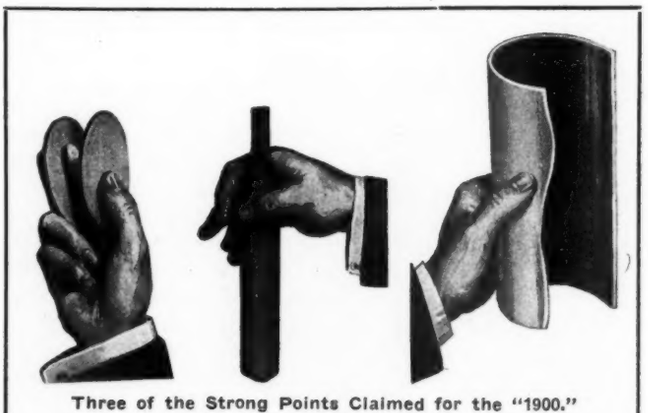
We may register steam pressure, we may keep count of the number of times the wheel goes round; but until Detective Burns' dictagraph comes into general use we can hardly hope to figure out the number of words used in a single day, says the Baltimore and Ohio Employes' Magazine, editorially. The telephone companies report that over fourteen billion conversations buzzed over the wires in the United States. Europeans didn't say half as much—over the telephone. Anyhow, those foreign folks do part of their talking with their eyebrows.

The telephone does sift words. You can hardly take down the receiver without having some notion of what you are about to say. It might help a little if we had to pay a nickel for the privilege of ordinary speech. It is a privilege, as an hour of enforced silence will prove to anybody. If taking thought about our conversation should make it heavy and self-conscious, that would spoil the delight of comradeship. It need not do that. If talk were more of an art it would be gayer, keener, less weighted down with dull commonplaces and useless repetitions. We have often listened to conversations in which practically every remark had to be repeated because the speaker was not interested enough to say the words clearly and the listener did not give attention.

There! We've left that receiver down while we strayed off a bit. That is one of the worst faults of the telephone-talker. The man at the other end of the wire is like a fellow in a dentist chair—at your mercy. You are bound to treat him as gently as possible. Don't try to tell him everything in one conversation, and likewise don't go off without telling him anything. You may want to get some information over the telephone yourself, some day. As the average man uses it, the talking wire is a great comfort—and a great nuisance. The nuisance would be lessened if we saved some of the hard words heaped on central or switchboard for our own chastening. It might be a wholesome thing if a man could call himself up and hear himself as others hear him.

Commission Fixes Maximum Rates.

The Georgia Railroad Commission has authorized the Gainsborough Telephone & Telegraph Co., owning and operating a local telephone exchange at Rockmart, Ga., to charge as its maximum rates $2 per month for residence telephones and $3 per month for business telephones. The present rates are $1.50 and $2.00 respectively.



Three of the Strong Points Claimed for the "1900."

These rates are in line with those approved by the commission for many other local exchanges throughout the state.